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THE MENTAL AFFECTIONS OF CHILDREN, IDIOCY, IMBECILITY AND INSANITY

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THE MENTAL AFFECTIONS OF CHILDREN, IDIOCY, IMBECILITY AND INSANITY

BY

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PREFACE

THOUGH not a few pages of my former book 'On Idiocy and Imbecility' are to be found in this volume, the changes are so considerable that they warrant a more comprehensive title. The principal additions to the new work are the pages on the Development of the Brain in Childhood, the Pathology of Genetous and Paralytic Idiocy, the chapters on Sclerotic and Syphilitic Idiocy, and that on the Insanity of Children. I am pleased to have this opportunity of being able to give my more matured views, though the principal merit of this work probably is that it brings together the widely-scattered studies of able observers on the subject of Idiocy and Imbecility.

Though the book is mainly intended for medical men, it is to be hoped that some parts of it will be found also useful to those who have the care and guardianship of idiots and imbeciles, or who take a philanthropic interest in provisions for their welfare. It gives me encouragement to know that some interest has been taken by the rising school of psychology in the United States in the lessons to be gained from mental pathology; nor do I yet despair of receiving some little attention from the students of psychology in Great

Britain. I am grateful for the generous support which I have received from many friends to enable me to bring out this book. I have especially to acknowledge the assistance which I have received from Dr Fletcher Beach, Dr T. S. Clouston, Dr A. Friis, Dr G. E. Shuttleworth, Mr Jakob Soethre, Dr T. Telford-Smith, and Dr John Thomson, to all of whom I am indebted for valuable information. The last two gentlemen have kindly afforded me the use of several Plates, enabling me to make the illustrations of the book more interesting and complete.

WILLIAM W. IRELAND.

School and Home for Imbeciles,
Mavisbush House, Polton,
Midlothian, 15*th May*, 1898.

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CHAPTER I.

DEFINITION OF IDIOCY AND IMBECILITY.

As idiocy is originally a popular, and not a scientific, term, it is difficult to frame a definition comprehensive enough to include all the meanings in which it has been used. The following seems to include both the popular and scientific use of the term. Idiocy is mental deficiency, or extreme stupidity, depending upon malnutrition or disease of the nervous centres, occurring either before birth or before the evolution of the mental faculties in childhood.

The word imbecility is generally used to denote a less decided degree of mental incapacity. The term feeble-minded is now much used in the United States of America, both in legal and medical documents, to denote both idiots and imbeciles.

Idiocy bears much resemblance to the ordinary condition of infancy. In idiocy the mental state may be said to be fixed in the infantile state, or very slowly to move towards the efficiency and maturity of the motor and reasoning powers which characterise the normal adult. Idiocy could not readily be confounded with any form of insanity, though it has a superficial resemblance to dementia, much in the same way that the dotage of old age sometimes resembles the weakness of childhood. Dementia begins with average intelligence, which gradually diminishes; idiocy begins with a low amount of intelligence, which gradually increases. The intelligence in dementia is generally getting less; in idiocy, on the contrary, it generally improves slowly until the period of

adolescence is reached. In dementia it is always difficult to say how much intelligence remains. Some dements have not lost the power of thinking or of concentrating their attention, but seem to abstain from doing so because any mental exertion gives them pain; and, under some unusual motive or stimulus, they occasionally manifest powers supposed to have been lost for years. Sometimes, too, though rarely, dementia ends in rapid and complete recovery.

The expression of the idiot is generally soft, good-natured, and confiding; that of the dement is heavy and sullen; past griefs and pain have left their deep cross furrows on his brow and traced broad wrinkles below the eyes, while the forehead of the idiot remains smooth till a late age. Sometimes, in asylums, where the history is lost, the chronic dement who has begun to stagger in his gait might be confounded with the grown-up idiot who, with his proneness to imitation, may simulate the appearance of the insane with whom he has been long shut up, but the downward progress of the malady would soon distinguish its victim.

CHAPTER II.

STATISTICS OF IDIOCY.

IDIOTS are a much more numerous class than is generally thought. In many countries they are more numerous than the insane, and in all as numerous as the deaf and the blind put together. This can be proved by what statistics we have,* and there is a strong presumption that on this point the statistics fall short of the truth. There are good reasons for believing that in most, if not in all countries which have a census, the number of idiots is considerably understated. Everywhere parents are unwilling to believe and then to admit that their children are of weak mind, and we may fairly assume that there must be a large number of idiots under five years of age who are never returned as such in any census. Koch found that in Würtemberg only 43 idiots were returned under five, while between the ages of six and ten years there were 294 returned. In Scotland, by the census of 1891, there were returned as imbeciles under five years, 31 males and 25 females = 56; under ten, 146 males and 106 females = 252; under fifteen, 269 males and 198 females = 467 ; and under twenty, 374 males and 215 females = 589. In all the census more persons are returned as idiotic or imbecile under fifteen than under ten or five years; whereas we have a good right to expect that the rate should be highest for the period under five years, and then steadily descend. On the other hand, the presence of a lunatic in a house is a much more patent fact

* See especially the laborious treatise, *Zur Statistik der Geisteskrankheiten in Würtemberg, und der Geisteskrankheiten überhaupt*, von J. L. A. Koch, Stuttgart, 1878.

than that of an idiot. Bourneville tells us in a recent work that, although the number of idiots in France is given as 36,000, this is much below the truth, and it is probable that their number exceeds 60,000. I have already pointed out, in my book *On Idiocy and Imbecility*, that although there were only 35,133 idiots returned in the census of France in 1872, it was shown by the inquiries of a Special Commission on Cretinism, published in 1873, that there were 122,000 cretins and idiots in France. In no country is this difficulty of getting at the whole truth about the prevalence of idiocy greater than in Scotland, from the proud, cautious, and reserved character of the people. Although the proportion of idiots to lunatics in Scotland has been stated in 1891 as 49 to 100, I have no doubt that if the census returns were correctly given, the number of the one would be at least equal to that of the other. As far as statistics go, we know that in Hungary, Prussia, France, Bavaria, and Saxony there is a preponderance in the number of idiots; in Sweden, Denmark, and Belgium there is a preponderance of the insane. The reasons for this difference are not known to me, but it is worthy of note that in countries such as France, Northern Italy, and Switzerland the number of idiots is swelled by the prevalence of cretinism.

Koch has compiled the following table to indicate the proportionate number of idiots to lunatics. For every hundred lunatics there were in—

Würtemberg,	97 idiots.	Denmark,	58 idiots.
Prussia,	158 „	Sweden,	22 „
Bavaria,	154 „	Norway,	65 „
Saxony,	162 „	England and Wales,	74 „
Austria,	53 „	Scotland,	68 „
Hungary,	140 „	Ireland,	69 „
Canton of Berne,	117 „	America,	79 „
France,	66 „		

In the census in Scotland in 1871 there were returned 138

imbeciles to every 100,000 of the population; in 1881, 160 imbeciles; and in 1891, 125, a diminution of 35 in the 100,000. The proportion of lunatics for the corresponding years was: for 1871, 202; for 1881, 225; and for 1891, 259 to the 100,000.

By the census of 1881 there were in Scotland 8406 lunatics, males 3939, females 4467; there were 5992 imbeciles, 2896 of whom were males and 3096 females. By the census of 1891 there were 10,445 lunatics, 4918 males and 5527 females; of imbeciles there were 5017, males 2506, females 2511. The number of the deaf and dumb in Scotland in 1891 was given as 2125, males 1195, females 930. The blind stood as 2797, males 1417, females 1380. The number of the total population in 1881 was given as 3,735,573, males 1,799,475, females 1,936,098. In 1891 it was 4,025,647, males 1,942,717, females 2,082,930. Thus the number of imbeciles had diminished both relatively and absolutely from 1881 to 1891. But this lesser figure probably was due, as I have shown elsewhere,* to a change in the definitions of the terms imbecile and lunatic in the census schedules. In fact there are so many reasons for distrusting the Scottish returns that it would not be justifiable to base any inference upon them. Statistics, however, go to prove that there has been an actual diminution of idiocy in Ireland,† as well as in Würtemberg and in the Duchy of Oldenburg. In the regions of the Alps, where cretinism has been endemic since the earliest historic times, there has been a great diminution in the number affected.

The Commissioners who arranged the census of 1891 in England were so dissatisfied with previous results that they

* See my paper in the *Edinburgh Medical Journal*, August 1895, p. 99.

† By the last census the number of idiots in Ireland was stated to have fallen from 8639 in 1881 to 6243; in 1881 there was one idiot to every 598 of the population; in 1891 one to every 754. The number of lunatics had increased from 9774 to 14,945. There was a noteworthy diminution in the number of congenital deaf-mutes from 3163 to 2570.

thought the returns of idiots and imbeciles were not worth collecting. Dr Shuttleworth* estimates that the aggregate number of all ages amounted in 1895 to about 42,000.

The following table, compiled by Dr Kollmann,† gives the proportion of lunatics and idiots to the general population. He found that there were in

	Inhabitants.		
	One Insane Person for every	One Idiot for every	One of either for every
England and Wales	574	771	329
Scotland	495	727	294
Ireland	554	803	328
Denmark	727	1248	460
Sweden	567	2554	464
Norway	539	835	328
Oldenburg	544	945	345
Prussia	1157	730	448
Austria	1688	683	486
Hungary	1129	761	470
Switzerland	.....	.....	344
Canton of Berne	392	335	181
Italy	.....	.....	608
France	683	1028	410
Belgium	748	2890	594
Holland	.....	.....	656
Bavaria	1022	659	401
Würtemberg	465	482	237
Saxony	1178	729	450

To any one who scans this table the diversities must be very striking. Why, for example, should there be such a great preponderance of idiots in Austria and Hungary, whereas in Sweden, Denmark, and Belgium there is such a preponderance of the insane? The most unhappy districts in Europe for insanity seem to be the Canton of Berne, where there is one person either insane or idiotic to every 181 inhabitants, and

* *Mentally Deficient Children; their Treatment and Training.* London, 1895.
† *Zeitschrift für Psychiatrie*, XL Band, 1884, page 481.

Schleswig-Holstein, where there is one to every 268, while in the neighbouring kingdom of Denmark there is only one to every 460.

Probably the most correct of all the statistical returns of the number of idiots and imbeciles comes from Denmark. After a special inquiry* in 1888-89, it was found that there were so affected 2106 males and 1751 females = 3857 in all, about one to every 500 of the population. At the same time, the number of the deaf was found to be 745 males, 666 females, in all 1411.

Norway.

In the census of Norway returns are asked of the insane from birth or infancy, most of whom must be idiots. Twenty years ago I published statistics showing that there was in Norway a decrease in idiocy of 14·6 per cent., while there was an increase in acquired insanity of about 11·55. Unhappily the decrease has not continued. In 1845 there was one idiot for every 1358 persons, and one insane person in every 619; in 1855, one idiot in every 1125, and one insane in every 560; in 1865, one idiot in every 834, and one insane in every 524 inhabitants; but by the census of 1876 there was one idiot in every 498, and one insane person in every 398. This startling result is, however, not considered to indicate a real increase, but to be owing to the questions in the schedules being put in so indefinite a manner that mistakes were made in the answers. In the census of 1891, which was more carefully taken, there were 1357 male idiots and 1074 females, 2431 in all, to a population of 2,001,000 souls—that is, one idiot for every 823 inhabitants. At the same time there was one insane person for every 376. These statistics thus bring out an increase both in idiocy and insanity, and this in face of the statement that drunkenness has

* See *Statistiske Undersogelser Angaaende Aandssvage i Danmark*, 1888-1889, ved J. Carlsen, Dr Med. Kjobenhavn, 1891.

much diminished in Norway, owing to the working of the Gothenburg system. In 1891, the deaf were found to be 1176 males and 963 females, 2139 in all. At the same time the blind numbered 1287 males and 1278 females = 2565.

What is gratifying, careful statistics show a steadily progressive decrease in the number of lepers. In 1856 there were 2598 so afflicted in Norway, 235 of whom were cared for in hospitals. In 1890 the number had sunk to 954, of whom 507 were in the leper hospitals.

Finland.

From the census of 1880 the number of idiots in Finland is stated to be 2701 to a population of 2,060,782. The number of the insane is given as 1586; of the deaf, 1183 males and 915 females = 2098; of the blind, 1634 males and 2724 females = 4358. The returns, especially of the idiots, are thought to be very incomplete.

United States of America.

The total number of idiotic and feeble-minded persons in the United States on June 1st, 1890, was 95,609; of these, 52,962 were males and 42,647 females; 84,997 were whites; 42,277 males and 33,633 females were born in the United States of America; foreign whites, 4875 males and 4212 females; negroes, 5788 males and 4796 females; the remainder Chinese, Japanese, and Indians, 22 males and 16 females. In the census of 1880 there were 76,000 feeble-minded persons in the United States, showing an average increase of 2000 a year. In 1870 the number of idiots was 24,395; of these, 22,766 were born in the United States.

The following shows the increase from 1850. Total number of idiots in the United States: *

1890	1880	1870	1860	1850
95,571	76,895	24,485	11,080	9149

The number of feeble-minded persons per 1,000,000 of population:

1890	1880	1870	1860	1850
1526	1533	636	602	681

In 1897 there were in twenty-four State institutions for the feeble-minded, 8492 inmates.

None of those specially acquainted with the subject of idiocy in America have much faith in the result of the general census of idiots in the United States. I have been told more care was shown in getting correct returns for the last census.

Dr Fernald estimates that taking the country as a whole, there is one feeble-minded for every 500 persons in the United States.

After going through the statistics of those countries which have a census, I am inclined to think that as a rough estimate this proportion of one idiot or imbecile to every 500 persons in the gross population holds good with most of them.

STATISTICS OF EPILEPSY.

Epilepsy appears to be commoner in some districts than in others, and commoner in the large towns than in the country. In the census of 1881 there were found in the Rhine Provinces of Prussia 3460 epileptics, about one to every 1177 inhabitants. 463 of these epileptics were under fourteen years of age. Of the whole number, 76·7 per cent. were found to be sound of mind, and 23·3 per cent. were mentally deranged. This census was known to be incomplete in the

* 'House Miscellaneous Documents,' 2nd Session, 47th Congress, 1882-1883, Vol. XIII, Part II, quoted in the journal of *Psycho-Asthenics*, September 1897.

returns from private houses. A more successful attempt was made in 1882 to count the epileptics in the little State of Mecklenburg-Schwerin,* with the design of gaining information anent the proposal of connecting a school for children so affected with the Training School for Imbecile Children at Schwerin. The schedules were entrusted to the clergymen of the different parishes to get filled up. The number of epileptics was found to be nearly the same as the number of idiots,—639 of the former and 658 of the latter. Taking an average for the town of Schwerin, from which they could not get trustworthy returns, it was estimated that in the Principality there was one epileptic to every 855 inhabitants. Up to twenty-one years of age there is a greater number of male epileptics; after that, of females. Amongst 639 epileptics, 167 = 25 per cent., were idiotic or insane; of epileptic children between six and fifteen years, 20 per cent. were weak in mind; of 639 epileptics, 430 were unmarried.

'Dr Peterson puts the number of epileptics in New York State at 12,000, or about two per thousand. A census made by Dr Bircher for the Canton of Aarau in Switzerland gives a rather higher figure—2·42 per thousand.' †

* See *Allgemeine Zeitschrift für Psychiatrie*, Band XL, Heft 4.

† *The Epileptic and Crippled Child and Adult*, p. 17. Charity Organisation Series, London, 1893.

CHAPTER III.

CAUSES OF IDIOCY.

Heredity.

IDIOTS frequently are born in families in which there is a decided neurotic tendency, as manifested by the appearance of insanity, imbecility, or epilepsy amongst the members. This is well illustrated in the genealogical trees published by Ludvig Dahl in his work on Insanity in Norway, and printed, with translation, at the end of my book on *Idiocy and Imbecility*. It would appear from these tables, that a single pair, unaffected with any neurosis, may give birth to children also healthy, and yet their children, grandchildren, and great-grandchildren may be affected with insanity, idiocy, epilepsy, or deafness, while other members of the same family stock are apparently healthy and intelligent, though the ancestral taint may appear in their descendants. Why some members of the family should be attacked and others spared, is often as impossible to say as why one in a family should become a great poet or a great mathematician, while his brothers and sisters do not rise above mediocrity.

The only common cause which appears in the genealogies is that they are scattered branches of a common ancestor. We may ask, what is the cause of this neuropathic tendency? how does it begin? and how is it established? Perhaps it takes generations to form, and this is difficult to study. In heredity you have the virtual causes wrapped up and acting through the parents. I have sometimes noticed converging peculiarities in the father and mother, such as narrowness of the upper jaw and abnormal shapes of the ears, ending by

idiocy in some of the children. In my book, *The Blot upon the Brain*, a hereditary neurosis has been traced through eight generations in the royal family of Spain. The following genealogy was compiled from my own inquiries. It was republished by Dr Clouston,* with some additions from private information to which he had access (see following page).

There are certain nervous diseases which often occur in different individuals of the same families, while other families are exempt, and two or more of these diseases are apt to occur at successive times in the same individual of the family. The children of epileptics are frequently insane, idiotic, or hysterical, and the descendants of an insane person are often epileptic, idiotic, or insane, or their epilepsy passes into insanity, or epilepsy supervenes upon the idiocy. Deafness, chorea, locomotor ataxia, hysteria, and other disorders of the nervous system now and then occur in the descendants, apparently as the result of an inherent neurotic tendency in the family stock.

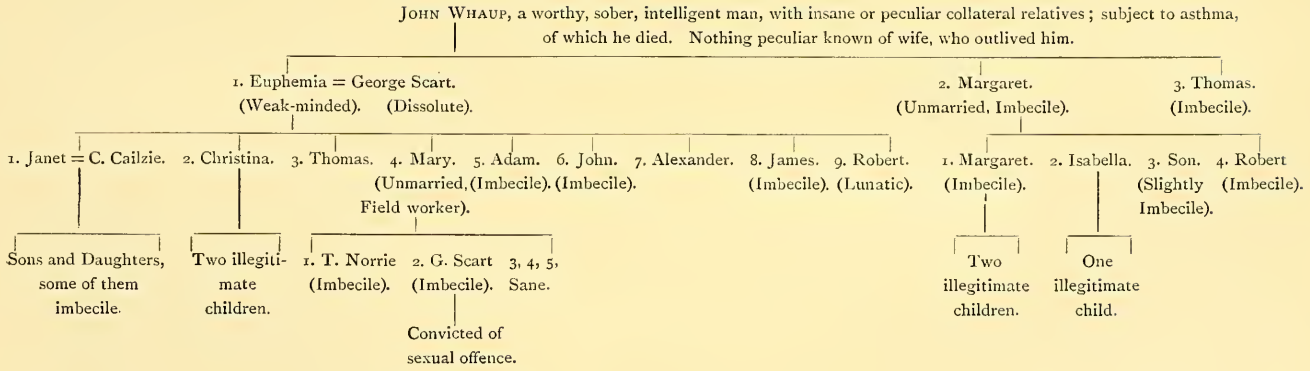
Naturally imbeciles are not often married; many male idiots are agamous, and many female idiots are undoubtedly sterile; but unhappily there are too many instances on record where imbecile or idiotic women have had children.

Haller, in his *Elementa Physiologica*, says that he knew of two noble-women who got husbands on account of their fortunes, although they were almost idiots, and that their mental defect has spread for a century through several families, so that some of their descendants are idiots in the fourth and even in the fifth generation.

The Commissioners appointed to inquire into the state of lunatics in Scotland,† ascertained that the number of idiotic women who have borne illegitimate children, and whose mental defect is frequently manifested in their offspring, was no less than 126, and the return was not believed to be com-

* See *Neuroses of Development*, p. 66.

† *Scottish Lunacy Commission Report*, Edinburgh, 1857, pp. 37-185, 186.


John Whaup, a worthy, sober, intelligent man, with insane or peculiar collateral relatives; subject to asthma, of which he died. Nothing peculiar known of wife, who outlived him.
1. Euphemia = George Scart. (Weak-minded). (Dissolute).
2. Margaret. (Unmarried, Imbecile).
3. Thomas. (Imbecile).
1. Janet = C. Cailzie.
2. Christina.
3. Thomas.
4. Mary. (Unmarried, Field worker).
5. Adam. (Imbecile).
6. John. (Imbecile).
7. Alexander.
8. James. (Imbecile).
9. Robert. (Lunatic).
1. Margaret. (Imbecile).
2. Isabella.
3. Son. (Slightly Imbecile).
4. Robert (Imbecile).
Sons and Daughters, some of them imbecile.
Two illegitimate children.
1. T. Norrie (Imbecile).
2. G. Scart (Imbecile). Convicted of sexual offence.
3, 4, 5, Sane.
Two illegitimate children.
One illegitimate child.

plete. 'Among the paupers in the parish of Kintore there was a fatuous mother with her two fatuous children. In the parish of Latheron, in Caithness, five imbecile females were named as having become mothers.' 'The largest number of children anywhere returned to one fatuous female was five; the mother being an idiot belonging to the parish of Erskine, in Renfrewshire.' These facts seemed to the Royal Commissioners to be of such grave import that they recommended, for the sake of public morality and civil policy, that all fatuous females should be restricted in their liberty, and be gathered together in poorhouses.

Esquirol saw at the Salpetrière an idiot woman the mother of two daughters and a son, all of them idiots.

Dr Howe writes*—'There are two or three towns in the State in which there are families of idiots, in which parents and children are all imbecile. In one instance, where a pauper female idiot lived in one town, the town authorities hired an idiot belonging to another town, and not then a pauper, to marry her, and the result has been that the town to which the male idiot belongs has for many years had to support the pair and three idiot children.'†

Idiocy is of all mental derangements the most frequently propagated by descent. Hereditary predisposition has been noted in from 20 to 50 per cent. of all idiots and imbeciles.‡

* *On the Causes of Idiocy*. Edinburgh, 1858, p. 78.

† Dr Fernald tells us that admission to the Asylum for the Feeble-minded was granted to an idiot aged sixteen years, when her mother at the last moment refused to send her. Ten years after, this woman was brought to the asylum after having given birth to six illegitimate children, of whom four still living were weak-minded. It was only after having been saddled with these burdens that the Municipal Authorities took the matter into their own hands.

‡ The methods of investigators into the etiology of idiocy, as well as their opportunities, are different. Out of 169 idiots about whom Dr Ludvig Dahl (*Bidrag til Kundskab om de Sindssyge i Norge af Ludvig Dahl, Reserve-laege ved Gaustad Sindssygeasyl.* Christiania, 1859, p. 78) had information, 84, that is, about 50 per cent., had insane relations; but out of 151 who had become insane, only 58, or 38 per cent., had such relations. In the Canton of Berne a hereditary neurotic tendency was made out in 55 per cent. of the idiots taken by the

When we say that idiocy is hereditary in the family of those of a neurotic constitution, we rather add a new mystery to the wonderful phenomena of life, than give any explanation of what we wish to account for. Why should a child inherit a disease from which its parents are free? Why should he inherit from his ancestors, generations removed, an affection from which their own children had escaped? In most cases the hereditary tendency alone is insufficient to be the cause of idiocy without the assistance of other influences favouring this unhappy sequence. Were this not the case, all the children in such families would be idiotic, which rarely happens. These accessory causes act with unusual efficacy upon individuals of a neurotic tendency, and probably determine the cast of the resultant disease, whether it is to

census of 1873. Dr Langdon Down, out of 2000 cases of idiocy, found that in 45 per cent. there were well-marked neuroses in the families of one or both parents. If the neuroses were marked on the mother's side, the first children were the most affected. If on the father's side, he found that it was the later born children who were affected. Dr Fletcher Beach found a history of hereditary predisposition in 76 per cent.

Koch (*op. cit.*, p. 155) found hereditary diseases in one-third of the cases of insanity which he examined. In 20 per cent. of his cases, hereditary influence seemed excluded, while in about 45 per cent. no reliable information could be obtained. Koch observes that, if we exclude the cases in which the condition of parents and relatives is unknown, we shall have 60 per cent. of the idiots and 63 per cent. of the insane who have neurotic relations, and 39 per cent. for the former, and 36 per cent. for the latter, in which a hereditary cause seems absolutely wanting. In the cases in which the idiocy was traced to a family neurosis, the nervous affection appeared in the parents or grandparents in 92 per cent., and in the collateral relations only in 7 per cent.

Koch found that 24 per cent. of idiots had brothers and sisters who were abnormal, while with the insane there were only 16 per cent.; hence he is inclined to think that heredity is more potent as a cause in idiocy than in insanity.

Dr Isaac Kerlin (*Enumeration, Classification, and Causation of Idiocy*, Philadelphia, 1880) in the hundred families which he examined, found 'as a concurrence, imbecility and insanity begetting idiocy' in 27 per cent.

Dr Rogers of Glenwood, Iowa, found marked hereditary neuroses in 25 per cent. of the cases which he examined.

Mr Hermann Piper (*Zur Ætiologie der Idioten*, Berlin, 1893) found that 18 per cent. of the congenital idiots at Dalldorf had nervous diseases in the parents and relations. In these cases, 60 per cent. of the neuroses were with the parents, 10 per cent. with the grandparents, and 29 per cent. with the collateral relations.

be insanity, epilepsy, or deafness, or some other nervous disorder. In the absence of hereditary predisposition, such accessory causes may, under certain unknown conditions, become the originating causes of idiocy.

Consanguine Marriages.

Some distinguished physicians have held that a marriage between near relations, even when both are healthy and of a healthy stock, is, in some unexplained way, liable to become the cause of hereditary disease in the descendants. Thus Trousseau, though he admitted that it is rare to see a deaf child born from the marriage of two deaf-mutes, nevertheless, founding on the inquiries of Boudin, held that the mere consanguinity of healthy parents is a frequent cause of deafness in the children. Others again assert that, though the marriage of blood relations may intensify hereditary tendency, it does not create it in a healthy pair. Thus the influence of a consanguine marriage is simply the influence of a double heredity. The proper way to examine the question clearly, is to find what is the proportion of marriages of blood relations in a given population, and then to inquire if there be in the issue of such marriages a larger percentage of insane, epileptic, deaf, dumb, idiotic, scrofulous, or otherwise unhealthy children. We find, however, that some of those who maintain that consanguine marriages carry with them an evil tendency, have reached their conclusion by a different and a very fallacious process of reasoning. They collect instances of cousins who have married and have had unhealthy children, as if this never happened to any one else. Those who advance that consanguine marriages apart from morbid constitutional tendencies have some harmful influence on the health of the children, ought to be able to show that in the children of such marriages there is a considerably larger

number of cases of idiocy or other hereditary diseases than in the whole population. This they have not been able to do.* Unfortunately our calculations of the number of such close marriages are only approximative, and till this number is ascertained there will always be room for doubt and misgiving. This, however, is not a purely speculative question, as a physician in practice will soon find. On the whole, it seems to me that the marriage of cousins or other relatives near in blood is not

* The number of marriages of first cousins in which there have been children born idiotic or imbecile has never been noted by careful inquiries to be more than 4·38 per cent. (Langdon Down), and this in the wealthy classes, among whom such close marriages are most frequent. Some have found the percentage much lower—·292 (Wilbur), 2 per cent. (Grabham), 3·4 (Ireland), 4 per cent. even when the consanguinity of the grandparents was counted (Beach).

I myself found, out of 204 families in which there were idiot children, seven marriages of first cousins and two of second cousins. In six of the families where first cousins married there were 42 children; in one the number of children was not given. In one of these families there were four idiotic and weak-minded children; in two families there were two imbeciles each; in one I suspect other members were at least weak-minded; and in three there was only one imbecile child.

To the second cousins there were 17 children in the two families; in one of them there were two boys imbecile. Thus, five out of nine pairs had more than one child idiotic or imbecile.

Mr Alfred Huth (*Marriage of Near Kin*, London, 1875), and Mr George Darwin (*Journal of the Statistical Society* for June 1875), who have most carefully examined this question, have both arrived at the conclusion that consanguineous marriages are not in themselves harmful—a view which Bertillon (*Bulletins de la Société d'Anthropologie*, tome VI), Auguste Voisin, and Bourneville have ably sustained on the other side of the Channel.

Mr George Darwin thus sums up: 'It seems probable that in England among the aristocracy and gentry about 4 per cent. of all marriages are between first cousins; in the country and smaller towns, between 2 and 3 per cent.; and in London, perhaps as few as 1½ per cent. Probably 3 per cent. is a superior limit for the whole population. Turning to lunatic and idiotic asylums, probably between 3 and 4 per cent. of the patients are offspring of first cousins.'

'With respect to deaf-mutes, the proportion of offspring of first-cousin marriages is precisely the same as the proportion of such marriages for the large towns and the country.'

The authors of *Deaf-Mutism* (Dr J. K. Love and W. H. Addison, A.C.P., Glasgow, 1896) remark that Mr Darwin has gleaned his figures from too narrow a field. Taking 2 per cent. as a probable estimate of the number of consanguine marriages, they present tables to show that 'amongst consanguineous unions congenital deafness is from two to three times commoner than when parents are not related' (p. 19). The estimate of 2 per cent. is likely to be the subject of contest.

dangerous, if there be no disease likely to descend by inheritance. This view is supported by the researches of G. Darwin, Dahl, Kerlin, Shuttleworth, Beach, and others, who have made special inquiries into the question. But if there be a neurosis in the family, as shown in the ancestors of collateral relations, it would intensify the proclivity.

If we assume that there may be a strong resemblance or parallelism in the whole constitution, as well as in the structure and growth of the different organs in two near relations, it is easier to understand how, when there is any inherent weakness in one organ, that a marriage with a blood relation should be dangerous for the offspring, just as two parallel rods are more liable to break when their weakest parts are opposite one another. I have already noticed that when cousins had idiot children they have had in four marriages out of five more than one child affected. As Sanson has put it, 'La consanguinité élève l'hérédité à sa plus haute puissance.'

Scrofula.

The most important of the influences conducing to idiocy seems to be the tubercular diathesis.* A considerable number of idiots have parents affected with phthisis ; a large proportion of the deaths with idiots and imbeciles are from the same disease. Perhaps two-thirds, or even more, of all idiots are of the scrofulous constitution.

Much of the work which falls upon the doctor of a training school for imbeciles consists in the treatment of the different local and general manifestations of the scrofulous diathesis, such as enlarged or suppurating glands, skin eruptions, ophthalmia, otorrhœa, strumous ulcers, and abscesses, and fully two-thirds of all idiots die of phthisis.

* Kerlin in the hundred families found the presence of phthisis in one or both parents as high as 56 per cent. Piper found phthisis in the parents and near relations in 23 per cent. of his cases of born idiocy.

It thus appears that this peculiar condition of malnutrition or perverted nutrition, designated scrofula, disposes to imperfect development of the nervous centres. There must be some further factor which brings out a specific deficiency beyond the usual manifestations of the strumous diathesis. It is only a small proportion of strumous children who are idiotic, and, indeed, some such children are unusually intelligent.

Dr Carl Looft* writes that rickets may be put down as the cause of idiocy in 19 per cent. of the cases which he observed at Bergen, Hamarstift, and Kristiansand, and this apart from hereditary transmission. We have no experience here of rickets being the cause of idiocy. Rickets rarely appear before the ninth month, when the child begins to be weaned, and as Dr Emmett Holt † observes, 'cerebral changes are rare, and those described are rather of accidental occurrence than dependent upon rachitic process.'

Most influences which lower the general health in the parents have been assigned as causes of idiocy, but, contrary to what might be expected, it does not seem to be a frequent consequence of hereditary syphilis, though I have met with a few apparent instances of the kind.

Drunkenness.

No one is likely to deny that this is a potent cause, both in forming a hereditary neurosis through several generations, and in bringing idiocy upon the children when the parents alone are given to drinking; but in what number of cases intoxication appears as a factor has been the subject of disputes. Toussenel wrote in *Le Monde des Oiseaux:* 'On sait que les enfants se ressentent généralement de l'influence passionelle qui a présidé à leur conception. La plupart des

* *Klinske og Aetiologiske Studier over Psykiske Udviklinsmanger hos Born*, af Carl Looft, Bergen, 1897, pp. 138-180.

† *The Diseases of Infancy and Childhood*, London, 1897, p. 222.

idiots sont des enfants procréés dans l'ivresse bacchique.' Langdon Down laid much stress upon an intoxicated state of the father, especially during the time of conception ; this he represented as the outcome of special personal inquiries. Jules Voisin * thinks that this cause is reinforced by the terror or repulsion of the mother. Dr Ludvig Dahl gave it as his opinion that to the abuse of brandy, especially in the fathers, but also in the mothers during pregnancy, may be assigned an important, perhaps the most important, influence in the production of the large number of idiots in Norway. On the other hand, Dr Looft, in his recent *Clinical and Etiological Studies*, found no more than 3·7 per cent., out of 539 idiots and imbeciles, whose infirmity could be traced to alcoholism in the parents.

Since Dahl wrote his book on *De Sindssyge i Norge*, now nearly forty years ago, we have been assured that there has been a great diminution in drunkenness without any apparent decrease in the number of idiots.

Drs Beach and Shuttleworth, examining 2400 congenital cases of which they had histories, found that intemperance accounted for 16 per cent. ; Dr Kind, examining 923 cases, found drunkenness in the parents in 11 per cent.

My own observations incline me to believe that drunkenness, especially as a sole cause, is not so important a factor as writers like Dahl and Down would have us to believe. I know it to be very common in some places where idiocy is scarcely met with. Those who assign so much to intoxication during conception ought to be able to show that a much larger proportion of idiots are born at certain times.

In Scotland many of the lower classes get drunk at the New Year time—whole villages at once. We might then expect a larger proportion of idiot children to be born about the beginning of October, or nine months after the

* *L'Idiotie*, par le Dr Jules Voisin, Paris, 1893, p. 19.

men come back from the herring fishing, when they generally have a carouse. This no one has noticed.

The children of drunken parents in many cases have an unhealthy nervous system; they are weak, unsteady, and excitable, and often have a diseased craving for spirituous liquors, but, in my opinion, idiocy is not the ordinary legacy which drunkards leave to their children.

What makes inquiries into the etiology of idiocy difficult and perplexing is that the given causes scarcely ever occur alone. There may be both heredity, drunkenness, and tubercle; there may be heredity in one parent and drunkenness in the other, and all the debasing influences which drunkenness generally brings along with it.

At the same time, it is not denied that the toxic action of alcohol may in some cases be the direct cause of idiocy.

This view derives further strength from some experiments which have been made by Cl. Bernard, Dareste, Maffucci, and others, to test the effect of different toxic agents upon the embryo in the egg. The latest known to me were performed by Ch. Féré upon the hatching of chickens in an incubator.* This distinguished neurologist tried the effect of mechanical vibrations and of injections of culture of tubercule and of alcohol into the albumen of the egg. He found that the same agents, at the same doses, have different effects at earlier and later periods of the incubation. When applied early, they had a tendency to retard development and to produce monstrosities; applied at later periods, they, instead of abnormal forms, were followed by a much larger number of deaths of the embryo. The liability to a greater mortality begins with the first appearance of a nervous system. Amongst the monstrosities described are atrophy of the head

* See his paper in *Teratologia*, October 1895, edited by J. W. Ballantyne, M.D., Edinburgh; also, *La Famille Névropathique*, par Ch. Féré, Paris, 1894, p. 21.

and deviations of form, indicating implication of the nerve centres and of the circulation. Dr Féré remarks that at whatever time the toxic agent is applied, one often sees embryos which resist and continue to take a normal development. This affords another proof of the individuality of the germ, which is also shown by remarkable exceptions in human degenerations. If we were to adapt the lesson of such experiments to human beings, we might say that deleterious and toxic agencies may at different periods of gestation produce monstrosities, genetous idiocy, deafness, and other defects, and later on cause death of the fœtus and miscarriage. Pellagrous parents sometimes have idiotic children.

Féré tells us that he found in these broods the characters signalised by Morel in the *Descent of the Degenerated*, dissimilarity in the same family, and the resemblance of the dissimilar types to one another in the various families. This dissimilarity of certain types from the parents, while they resemble one another, is often well marked in idiocy; for example, Mongolian idiots are like one another, while unlike their parents or brothers and sisters. But dissimilarity is far from being a constant phenomenon in teratology. In many cases we have to do with resemblances which may become exaggerated. The reproduction of malformations or deficiencies in great and important organs like the brain or the lungs, appear to me less surprising than the reproduction of trifling peculiarities in the integuments.

We have authenticated cases of webbed fingers running in families, and of retinitis pigmentosa descending through generations. A curious example of the persistence of a trifling and isolated peculiarity was recorded in an Italian journal, and the genealogy was produced in the *Edinburgh Medical Journal* for November 1895. It showed how a white tuft of hair on the forehead descended through six generations.

Influence of Gynagogues.

Dr Seguin, in a lecture delivered before the New York Medical Association, remarked that idiocy was increasing in the State of New York ; the cause of it he found in the unsatisfactory social conditions which some people wish to introduce into this country. 'We overburden women,' says Dr Seguin ; 'they overburden themselves, and choose or accept burdens unfit for them.' 'As soon,' he says in another place, 'as women assumed the anxieties pertaining to both sexes, they gave birth to children whose like had hardly been met with thirty years ago—insane before their brain could have been deranged by their own exertions—insane, likely, by a reflex action of the nervous exhaustion of their mother.'

The antagonism created by social agitators of the gynagogue class had already borne evil fruit. 'Children gotten under such moral and other pressures cannot truly be said to be born from the union, but rather from the disunion of their parents conceived in antagonism ; they can only be excessive in their tendencies, or monsters in their organisation.'

The unquiet speculating life led by many in New York, where riches and extravagance, disappointment and failure, swiftly follow one another, has effects which Dr Seguin points out in a striking instance :—'I have attended a mother of a remarkably fine family of four children, whose fifth was affected in this wise. During that pregnancy her husband was deeply involved in speculations ; he would say nothing then about his chances, but she knew daily, by the way he ate, how much he had lost. One day she saw him swallowing his dinner without masticating at all. She fainted away, the child hardly moved after, and was born a cripple and an idiot.'

Fright to the Mother.

Fright to the mother, or other painful emotion during pregnancy, is often assigned as the cause of idiocy. There are sometimes other causes, such as hereditary tendency in the family, or drunkenness in one or both parents; but it by no means follows that because we can indicate a predisposing cause that the shock to the mother could not have been the exciting one. In many cases, however, the fright is the only apparent cause. Stories illustrating the influence of mental impressions of the mother upon the child she is bearing, are very numerous, and some of them very striking. In all ages women have believed that fright or extreme distress is dangerous to their offspring, causing weakness, deformities, or deafness, and I see no valid reason for denying that such influences during pregnancy may, in some cases, produce idiocy in the child of healthy parents who would otherwise have been born free from mental deficiency. One woman lost her husband at sea; another got a fright from a horse running away with a coach in which she was; another was terrified by the riotous behaviour of drunken sailors in a prison, her husband being the jailor; another woman got a terrible fright by seeing a man attack her husband with a cleaver. Mr Paget gave a case where a girl bore a great resemblance to a monkey, and had a crop of brown, harsh, lank hair on the back and arms. The mother had in the early period of pregnancy been terrified by a monkey jumping on her back from a street organ. Baron Percy, a French military surgeon, observed that out of ninety-two children whose mothers had been exposed to the terrors of a tremendous cannonade at the siege of Landau in 1793, sixteen died at the instant of birth; thirty-three languished from eight to ten months and then died; eight became idiotic, and died before the age of five years; and two came

into the world with numerous fractures of the bones of the limbs.

It has been supposed that the anxiety and distress of the mother has the effect of increasing the number of idiots amongst illegitimate children. This has been supported by statistics drawn from eight shires in Scotland, in which there were 17 per cent. of idiots, though the ordinary proportion of illegitimate births was only 10 per cent. But then, bastard children are more likely to be thrown on the rates, and thus their existence to become known, than children born in wedlock. Moreover, simple-minded women are easily seduced, and the children borne by them are likely to inherit the mental weakness of the mother. Thus, instead of the unmarried state being the cause of the idiocy, the weak-mindedness may be the cause of the illegitimate birth. Many of the idiots born out of wedlock whom I have seen in Scotland were children of simple-minded women.

Koch observes that no more than 2 per cent. of the idiots in Würtemberg were natural children,—a much lower proportion than that of illegitimate births in the whole population. Dr J. Carlsen found that only 5 per cent. of the idiots were illegitimate, while about 10 per cent. of all births have been illegitimate in Denmark for a long period of time. Dr Carlsen observes that it is probable that the number of the imbeciles overlooked or forgotten in the counting is larger within the class of legitimate than within that of illegitimate children. We incline to the supposition, even if proper attention is paid to the fact of the greater rate of mortality for illegitimate children, that imbecility is scarcer among natural than among legitimate children, which accords very well with the fact that the more malignant forms of imbecility occur less frequently among the illegitimate children.*

* 'Burdach behauptete dass uneheliche Kinder als Kinder der Liebe mehr Geist, Schönheit, und Gesundheit besässen, wie ehelich gezeugte, und dass bei

The number of male idiots is everywhere greater than that of female ones in the proportion of about two to one. Some attribute this to the greater size of the male head, exposing the infant to greater difficulties and injuries during labour. In such cases we should naturally expect a history of difficult or prolonged labour, but this is not often verified. It seems likely that the development of a male child is a greater trial upon the formative powers of the mother, and when these are insufficient, a breakdown in a complex organ is more likely to occur with a male infant than with a female. Perhaps it is on this account that montrosities are commoner with male children.

ETIOLOGY OF DEAFNESS.

Though in idiocy the defective development of the cerebrum is the most important lesion, it is far from being the only one. Moreover, the lesions are not constant. Sometimes one part of the nervous centres is attacked, sometimes another, hence we need not be surprised that the assigned causes of congenital deafness are often the same as those of idiocy. It has been found that there is a much larger number of deaf persons in districts where goitre and cretinism prevail. Deafness is one of the manifestations of the cretino-genetic miasma.

In the elaborate work of Dr Mygind upon *Deafness*,* the hereditary character of that nervous deficiency is shown in a convincing manner. The statistics collected by Parsons,

Abneigung der Eltern die Kinder hässlich und weniger lebhaft werden sollten, Ansichten, die sich auch noch bei Ribot wiederfinden.' *Die Thatsachen der Vererbung*, von Dr E. Roth, Berlin, 1885, p. 94.

Dr Jules Voisin observes (*L'Idiotie*, p. 19)—'Dans certaines provinces, la beauté et l'intelligence des enfants naturels sont passées en proverbe. L'état d'esprit des procréateurs, l'attrait et l'affection qu'ils ont l'un pour l'autre, ont donc une influence favorable.'

* *Deaf-Mutism.* By Holger Mygind, M.D., Copenhagen. London, Rebman, 1894 ; and *Idiocy and Imbecility*, Appendix, p. 405 ; also, my paper on the 'Etiology of Deafness,' in *Edinburgh Medical Journal*, September 1895.

Mygge, Hartman, Buxton, Turner, and others, though made in different places and varying in details, all go to show that the marriage of one person born deaf with another who can hear, brings into the world deaf children much oftener than when both parents are normal. When both parents are so affected, the proportion of deaf children is about three times greater than when only one parent is deaf. In the United States it has been observed that the bringing together of deaf pupils of both sexes in schools for the deaf is apt to result in intermarriages, which, if carried on for generations, might result in the breeding of a class of deaf-mutes.

It often occurs that there are more than one deaf child in a family. 'I know,' Saegert* tells us, 'of a family in which there were seven children, four boys and three girls. The boys were all deaf-mutes, the girls sound. I know also a family in which exactly the reverse occurred. There are other families in which all the children, without exception, boys as well as girls, following one another, were deaf. In one family five children were deaf, and the sixth was born and grew up without any trace of disease of the organ of hearing.' In the census of Ireland for 1891, there were returned 11 deaf-mutes in one family, 8 in two families, and 6 in four families. Mygge says that not less than 90 out of 226 congenital deaf-mutes—that is, about 40 per cent.—had deaf and dumb brothers. In fact, the occurrence of several deaf children in one family is of more common occurrence than that of several idiots. Sometimes in families with deaf children there are twins, when both may be deaf, or only one, the other child being normal.

It has been several times observed by different inquirers, that marriages producing congenital deaf-mutes were unusually fertile, about 6 per cent. on an average. It frequently

* *See* das Taubstummen-Bildungswesen in Preussen, von C. W. Saegert, General-Inspektor des Taubstummenwesens, Separat-Abdruck aus dem Taubstummen-freund von 1874 und 1875.

happens that there is no deafness in the ascending line of the parents and grandparents, while deaf-mutism appears in the collaterals. Thus every 16th deaf-mute was found to have some such relative. Altogether the following conclusions, given by the Danish physician with regard to congenital deafness, would require little adaptation to be applied to congenital idiocy :—'Deaf-mutism is comparatively frequent among the relatives of deaf-mutes; it is least frequent among them in the direct ascending line (grandparents, parents); more frequent in the collateral branches (great-uncles, great-aunts, uncles, aunts, grandparents' cousins, parents' cousins, and second cousins); and most frequent by far among the brothers and sisters of the deaf-mute. This is in exact accordance with the result of an investigation into the appearance of deaf-mutism among the relations of congenital deaf-mutes; therefore, and from many of the facts above mentioned, we are justified in supposing that the manner in which deaf-mutism appears in different generations is a result of certain qualities appertaining to its congenital form.'

Mygge is inclined to think that consanguineous marriages also play a part in favouring congenital deafness. In this connexion it may be worthy of mention that it is stated in the Irish census for 1891 that too close consanguinity or intermarriage of relations as a cause of deafness is an ascertained fact. In a census of the deaf in Norway, made by Dr Uckermann of Christiania, it was found that 23 per cent. of the cases came from consanguineous marriages—that is, the parents were cousins, or more nearly related. Uckermann estimates the proportion of such close marriages in Norway as from 4 to 5 per cent.

Tuberculosis and drunkenness also appear as causes of some potency; about 11 per cent. of the parents of congenital deaf-mutes were found by Mygge to be addicted to drink, and 8·7 of the parents of children who had acquired deafness. The

general health of the deaf is much better than that of idiots; some of the former, indeed, are very robust.

From a review of the statistics bearing on the point, Mygind is inclined to believe that illegitimate children are not only less liable to idiocy than legitimate children, but also less liable to deafness. Illegitimate births in Saxony were stated to be about 12 per cent. of all births, while only 6·2 per cent. of the deaf-mutes were born out of wedlock. In Denmark, 27 deaf-mutes were illegitimate out of 514, *i.e.* 5·4 per cent., while the proportion of natural births is about 10 per cent. to the total number of births. In Denmark, 5·1 per cent. of the mothers of the congenital deaf-mutes included in the inquiries were unmarried, also 5·8 per cent. of the mothers of children with acquired deafness were in the same position. It is possible that there may be a higher mortality amongst illegitimate deaf children, but this can scarcely be sufficient to account for so decided a minority in their numbers.

ETIOLOGY OF EPILEPSY.

The general causes assigned for epilepsy are much the same as those for idiocy. That the malady is frequently transmitted by heredity is clearly proved by Dr Féré.* He observes that when the marriages of epileptics have an average fecundity, scarcely one-fifth of the children are healthy. Epilepsy seems to be propagated more directly than other neuropathic diseases. This is what is called similar heredity. Eccheverria† found that out of a total of 572 epileptics, 39 per cent. had a hereditary taint received directly from the parents. In many cases epilepsy appears in the collateral lines, and sometimes passes over the son or daughter to affect the grandchild. Sometimes, on the other hand, the neurosis takes another form, such as idiocy, insanity,

* *Les Epilepsies et les Epileptiques*, chap. xviii. Paris, 1890.

† 'Alcoholic Epilepsy,' *Journal of Mental Science*, January 1881.

hysteria, hemicrania, or the epilepsy is combined with these affections. Perhaps as many as one-fourth of all idiots are epileptics, or take fits now and then. Drunkenness in the parents is found to be a common cause. Eccheverria found it in 17 per cent. of his cases; but Wildermuth in less than 2 per cent. Excess in alcohol may originate epilepsy or bring it back after the disease seems to be cured. The craving for intoxicants may itself be an inherited disease apt to propagate its like or some other form of neuropathy. Epilepsy is occasionally caused by injuries to the head or cerebral tumours. Brown-Sequard has proved by experiment that guinea-pigs may be rendered epileptic by lesions of the sciatic nerve or of the spinal cord, and that this epileptic proclivity was transmitted to their descendants, and Luciani has observed the hereditary transmission of epilepsy in animals in which the disease was provoked by irritative lesions of the brain.

NEUROPATHIC HEREDITY.

Through the careful sifting of observed facts we have arrived at the generalisation of a hereditary dyscrasia which may follow a family for generations, often taking the form of a neurosis. We are not bound to suppose that the morbific influence is always directed on the nervous system. Causes may be so grouped that the dyscrasia may show itself in a miscarriage, or a still-birth, or in the ordinary symptoms of the strumous diathesis, or it may not appear at all in some of the children or their descendants, or it may pass over a generation, though not unfrequently more than one idiot appears in a family, and sometimes four or five; the majority of the children are generally healthy enough, though they are liable to transmit the neurosis to some of their descendants. We must therefore conclude that the hereditary predisposition is, in most cases, insufficient alone to become the cause of

idiocy, but requires to be reinforced by other unfavourable influences. These, in some cases, may be successfully avoided, or they may encounter the subjects in after years when the unfortunate heir may become a lunatic, or an epileptic, or have some less serious nervous affection, or he may entirely escape during his whole life. Such generalisations seem to me a correct interpretation of facts met with by all experienced physicians, though they are scarcely capable of exact proof. This neurotic tendency is accompanied by various abnormalities of structure, sometimes called stigmata, which are supposed to be often accompanied by deficiencies in the brain and nervous system. Writers on criminal anthropology have advanced that these deficiencies are shared by the idiotic, the insane, the epileptic, and the habitual criminal class, and this is so far true that in general all give more or less indications of a defective formative force, which shows itself in imperfect organisation and feeble functional power, now here, now there, in various parts of the body. It has, however, been found much easier to point out that such stigmata are commoner with these different classes compared with equal groups of normal persons, than to assign a special form to each class. In spite of all that has been written by the professors of the Italian school of criminal anthropology, many physicians well acquainted with jails and their inmates deny the existence of any special type of delinquent founded upon structural peculiarities.

The application of the idea of atavism in connection with the Darwinian theory of evolution has proved especially unfortunate when introduced into pathology.

We have been told by some criminal anthropologists that in the habitual criminals in the slums of our large cities we see the reversion of the free savages who once roamed in the forests of Germany or Britain. Lombroso finds features

common to both in the scanty hair, the light bodily weight, the small cranial capacity, the retreating forehead, the early synostoses of the sutures, the large temporal sinuses, the great development of the under jaw, the inequality of the orbits, the unclean skin, the large deformed ears, the closer resemblance between the sexes, the comparative insensibility to pain, the callousness of disposition, the courage combined with cowardice, or idleness, boasting, and superstition, the fondness for metaphor, and the taste for tatooing.

But many of these traits are not characteristic of savages: the scanty beard may be found in the Mongolian, but certainly not in the ancient Germans or Caledonians. Some savage races have large and well-formed crania. The high or vaulted palate, and the irregularly-placed and ill-formed teeth, and the inequality of the orbits common in the criminal class, are not so with savages; and what about the deficiencies of the senses? It is generally believed that the senses in savages are very keen. The lowest savages we ever saw were the Bosjesmans and the Terra del Fuegians, and we do not think that if born and educated in the slums of a great European city such creatures could have taken the place of the burglar, the pickpocket, or the forger. And if amongst barbarous tribes some correspondences of the weak-minded or the born delinquent had come into being, they would have perished in infancy, or sunk in the efforts to gain food, or perished in the feuds of warring savages.

If a creature had progressed from apehood into an animal like the burglar or the pickpocket, he would never have progressed any further. The habitual malefactor who fills our jails is a degraded product of our complex civilisation. It is our social system, with the sacredness which it attaches to human life, that brings forth, sustains, and protects the existence of these creatures, who belong to a pathological type, not to a physiological one. It is a mere waste of time

to study the habitual criminal apart from the antecedents which have led him, and the circumstances which keep him at war with society.

In the following pregnant passage Féré states what has been remarked by other experienced observers:—'What favours the multiplication of neuropathic degeneracies is that neurotic persons of every kind have a remarkable tendency to seek one another, and this pathological selection contributes to swell the number of epileptics. This proclivity is manifest not only amongst the unstable, the eccentric, the hysterical, and the insane, but also in another category,—the criminals with whom vice becomes the ground of a special selection; and it is known that there are numerous connections between criminality and epilepsy.'

Féré* has described the neuropathic tendencies as a dissolution of heredity. In the natural course of things each pair reproduces their like; but sometimes, through troubles of nutrition or some inscrutable misdirection of formative force, the descendants do not inherit the normal form or all the qualities of the race, and are in consequence unable to adapt themselves to the conditions of existence. If this go on, the result must be a diminution of vitality, and final extinction. Authors are apt to describe this progressive degeneration of a neurotic family as something fatal and inevitable, which can only end in sterility, idiocy, and insanity.

Morel† gives a notable instance of this process of extinction in a family:—In the first generation there was immorality, depravation, alcoholic excesses, and brutalisation. In the second generation, hereditary drunkenness, attacks of mania and general paralysis. In the third generation there was sobriety, hypochondriac tendencies, melancholia, delusions that

* *La Famille Névropathique, Théorie Tératologique de l'Hérédité et de la Prédisposition Morbide.* Paris, 1894.

† *Traité des Dégénérescences Physiques intellectuelles et morales de l'espèce humaine.* Paris, 1857, p. 125.

he was persecuted by others, and homicidal tendencies. In the fourth generation the intelligence was feeble. There was an attack of mania at sixteen years of age, stupidity, transition to idiocy, with probable extinction of the race.

Dr Howe is eloquent about the laws of nature which act with unerring certainty, and holds that 'it may be assumed as certain that in all cases where children are born deformed, or blind, or deaf, or idiotic, or so imperfectly and feebly organised that they cannot come to maturity under ordinary circumstances, or have the seeds of early decay, or have original impetuosity of passion that amounts to moral insanity, in all such cases the fault lies with the progenitors.' No doubt there must be something wrong in the antecedents, but one might fairly expect, from a good deal of writing of this kind, that the parents of idiot children must be, to a marked degree, puny, degenerate, weak, scrofulous, drunken, and stupid people, who live in daily defiance of the commandments in Combe's *Constitution of Man;* nevertheless, a little actual intercourse with them would disabuse anyone of such an opinion. While such degeneracy as is described by Morel may be the end of those unfortunate families in which a weakly and faulty development struggles on in the midst of unhealthy and vicious surroundings, in families under better conditions there is no need for such a hopeless view. It frequently happens that idiots are born into a family where the father and mother and the brothers and sisters are apparently quite healthy, and live in obedience to the laws of health, and in whom hereditary disease is denied. Many of the parents of idiots are people who are rising, instead of sinking in the world. One might compare such families to a tree that has some dead branches which in time will drop off, while there are other branches which remain green and strong. It has been repeatedly observed that families in which neuropathic members appear are often more prolific than the average.

I found that out of 204 families in which idiot children occurred, the average number of the children was 6·27, and Dr Kerlin, in his hundred families found the mean fecundity to be 5·6. In fact, idiots are oftener born into large families than into small ones, and are rarely only children. While some families go on increasing in the number of their degenerate members, there are others which, through happier circumstances, leave behind ancestral defects. Some of these circumstances are so far known that medicine may help them in advising proper measures of prophylaxis and treatment. I know of some families where one or more brothers are imbecile, while others are earning distinction. I have observed other families in which the abnormal children become fewer in each generation, and finally cease to appear. There is always a tendency to return to the normal or average condition of the race.

In a healthy race, living a pure and temperate life, I imagine that born idiots will be rare, and that the proportion of those who become so from accidental causes will be greater; but in a society struggling under unhealthy and disquieting influences, idiotic children will be more numerous, especially if these influences act upon the constitution of the mother. But it cannot be overlooked that there are many instances of idiocy, the causes of which cannot be explained, and there are other known causes which, in the present state of society, cannot be fairly avoided. After all, nobody makes the mere maintenance of the highest state of bodily vigour either in himself or his offspring the prime end of existence. It is very likely that if you get a thousand rich men into a lecture-room, men who could live where they pleased and do what they liked, you might convince every one of them that their probability of life would be fifteen years greater if they went and lived in one of the Hebrides or some dull spot in the Highlands, that they and their wives would be healthier, and

that they would have less chance of losing any of their children; they might be thoroughly convinced of all this, and yet possibly not one of them would go and settle in these salubrious localities. Even medical men, whose knowledge of physiological laws has been tested by examination, often set the example of utterly defying them. I know of an instance of a man who married a woman who had been several times insane, and of another who married an imbecile girl, and both these men belonged to the medical profession.

CHAPTER IV.

THE CLASSIFICATION OF IDIOCY.

BESIDES these general causes of idiocy, whose vagueness is not favourable to scientific inquiry, there are more determinate and proximate causes; the child becomes idiotic either through lack of development or nutrition, or through disease or injury befalling the brain, before or after birth. This brings us to the classification of idiocy which I attempted in 1872, based upon pathological conditions. It was at once adopted by my genial friend Dr David Skae of Morningside Asylum, and has been made use of by many distinguished writers on insanity; and since it is recommended in the latest Manual of Mental Diseases, that by Dr A. Campbell Clark, as probably the best classification for simplicity and practical advantage, I may presume that it is not yet superseded. It may be prudent to add that no classification of diseases was ever attempted which was not liable to numerous objections, and that the only way to overthrow an arrangement of this kind is not to find faults in it, but to frame a better one.

There always must be some awkwardness about the classification of insanity. It is regarded as aberration of function of the nervous centres, the result of a number of nervous diseases. The physician who wishes to have a proper knowledge of insanity from a medical point of view must study the pathological conditions of which it is the symptom or the result, and when he has done so, it is impossible for him to disconnect one series of observations

from the other—the mental aberration from the accompanying disease of tissue or pathological symptoms. Insanity, therefore, can neither be viewed alone, nor can it, from its great importance, be regarded as merely a symptom of various nervous diseases, especially when most of these diseases may run their course without its manifestation. Thus we have epileptic or paralytic insanity, although we may have epilepsy or paralysis without any lasting mental disorder.

At any rate it would be very inconvenient for us to want a classification of insanity founded upon pathology and etiology. Nor is it a fair objection to such classifications that they are in the present state of pathology imperfect, and in part, at least, likely to be swept away by the advance of pathology; for who acquainted with the history of medicine will affirm that imperfect nosologies have been of no use? On the other hand, it would be very inconvenient to dispense entirely with psychical divisions of insanity. The insane are deprived of their liberty and collected in asylums on account of their mental deficiencies and aberrations, and the character of such deficiencies will always be important, both to society at large and to those who have the charge of them. If our classifications, psychical and pathological, approached completeness, they would bear an understood relation to one another. If we were to consider the deficiencies of an optical instrument like a microscope, we could describe them in two ways. We might say that objects were seen through it in colours which did not properly belong to them, or that their shapes were ill-defined, or that they were seen dimly, with too little light. In this way we indicate the faults of the instrument by describing their effects upon the eye of the observer. On the other hand, we could describe these faults directly; we could explain how, owing to imperfection in the shaping of the glasses, the lenses failed to bring all the rays of light into one focus, *i.e.* spherical aberration; or that, owing

to the nature of the glasses, unequal refraction of the rays took place, *i.e.* chromatic aberration ; or, owing to want of due transparency, or to the glasses being soiled, enough of light did not pass through. The one class of explanations would represent the psychical classification, the mind standing in the same relation to the organism as the eye does to the microscope. The other would represent the pathological classification. As our knowledge of the physiology of the brain is something very far behind our knowledge of the laws of light and optics, we are not nearly so successful in bringing the psychical and physiological systems into accord.

Idiocy or imbecility comprehend cases quite distinct in their etiology, pathology, and treatment, which, however, unite to produce the deficiency of intellectual, nervous, and muscular power. As the mental deficiency is the most serious of the symptoms or consequences of the diseased condition, it is of great importance that the degree of mental feebleness should be defined. Hence the necessity of psychical definitions, such as the popular ones of idiot, imbecile, and feeble-minded, indicating three degrees of mental obtuseness. Moreover, since it is impossible, from the other symptoms, to arrive at anything like an exact conclusion as to the extent of the diseased action, the mental faculties still spared are of great value in examining an idiot with a view to prognosis and treatment. At the same time any one who trusted to mental symptoms alone would fall into grievous errors ; for example, it would be incorrect to give the same prognosis for an epileptic as for a traumatic idiot, from the degree of intelligence left. In the one case we have an existing disease still likely to cause further mischief ; in the other we have a lesion come and gone, whose unfortunate effects may be expected to diminish through time. In short, all kinds of idiocy have not the same future, nor ought to be treated in the same way. To

group them all together is as absurd as to go on measuring the heads of microcephalic and hydrocephalic idiots, and to generalise the results into one useless average.

As we have arrived at some facts in studying idiocy in connection with the diseases which give rise to it, we need to have them arranged and classified; thus we must have a pathological classification as well as a mental one. The human mind, bounded in its insight, requires to look at the subject in two aspects, and for the same reason that we require to see a solid body on every side, unless it happens to be transparent. In a similar way, we have different classifications for human beings according to the point of view from which we regard them. Take for example Socrates and Cæsar, Confucius and Timur Khan. In respect of their mental powers and pursuits, Confucius and Socrates would fall into the same rank as philosophers, and Cæsar and Timur Khan as rulers or warriors. But then we might classify them with the eye of a zoologist, when Cæsar and Socrates would go together as Aryans, and Confucius and Timur Khan as Mongolians. In a like way, an epileptic idiot might fall under the same mental division as a hydrocephalic one, if we classify him from the degree of intelligence left. Nevertheless, we cannot refuse to take into consideration the modifying influence of the special disease upon the course and prognosis of the idiocy; and, as a general rule, the different divisions of idiocy proposed below have certain mental characteristics in common, somewhat in the same way as the Mongolians and Aryans seem to have got a prevailing character. Some authors have divided idiocy into congenital and acquired—a distinction which appears to me of little value where the pathological causes are the same. Most of the diseases which produce idiocy may occur before birth as well as after it, and we do not require a double pathological classification, without any sufficient difference either in the nature of the lesion or

its results. Coming to the study of idiocy after having gained some experience in medicine, I have from the beginning viewed it from the standpoint of pathology; and my idea of idiocy is compounded of the following classes, which are generalised from individual existing idiots, who resemble one another by having the same or similar diseases, as they resemble the type of idiocy by having mental deficiency along with a corporeal disease.

1. Genetous Idiocy.
2. Microcephalic Idiocy.
3. Hydrocephalic Idiocy.
4. Eclampsic Idiocy.
5. Epileptic Idiocy.
6. Paralytic Idiocy.
7. Traumatic Idiocy.
8. Inflammatory Idiocy (the result of Encephalitis).
9. Sclerotic Idiocy.
10. Syphilitic Idiocy.
11. Cretinism (including the Endemic and Sporadic or Myxœdematous Forms).
12. Idiocy by Deprivation.

CHAPTER V.

GENETOUS IDIOCY.

Nature and Symptoms.

In my previous essays at classification I used the term Congenital Idiocy to comprehend all those cases which, shrouded in the obscurity of intra-uterine life, cannot be traced back to any known specific disease, but good care was taken to explain that other forms of idiocy, such as microcephalic, or paralytic, or hydrocephalic, might also be called congenital, though not in the same sense. In spite of all this, objection was used against the class, which had no force if the explanation given had been held in view.

As the word genetous idiocy was first used by me, I may be allowed to affix a special meaning to it. We must still have a class to comprehend cases whose pathology cannot be properly diagnosed till after death. Thus, cases of inflammation of the brain occurring before birth, are, as far as my knowledge reaches, generally not distinguishable from other congenital cases. In process of time, by carefully studying the symptoms in life and the lesions after death, we may be able to resolve genetous idiocy into some new or old classes. At present, if we cannot classify some of our cases in a more precise way, we at least may save confusion by putting them aside from the other classes, and inviting attention to the unresolved problems which they represent.

As in genetous idiocy the diseased condition, entailing

deficient mental manifestation, is complete before birth, the presumption of a hereditary connection is stronger than in other forms. If the family history be known, there are often parents, aunts, or uncles, who have been insane, imbecile, epileptic, or deaf, or have suffered from some other disorder of the nervous system.

Sometimes the genetous idiot is the youngest child of a large family, especially when the parents are advanced in life. Sometimes he is a child prematurely born. Anxiety and fright to the mother during gestation are frequently put down as the original cause. I have seen a case where one of the idiots was a twin, while his sister was of ordinary intelligence. In another instance the twins, brother and sister, were both idiots. In a third an idiot boy was one of three at a birth, the other two dying in infancy. In this class constitutional diseases are common, especially scrofula. The strumous taint shows itself in a great variety of ways, by enlarged glands, glandular abscesses, ophthalmia, otorrhœa, or skin eruptions. Fully two-thirds of genetous idiots die of consumption. Rickets are also associated with this form of idiocy, but in a meagre proportion of instances if compared with scrofula ; the association with syphilis is rare.

The circulation is often feeble, and the general temperature a degree or two lower than usual, and the limbs, especially the lower ones, are frequently cold. Such patients are very subject to chilblains. Sensibility is deficient ; they allow their shoes to gall their feet without complaining, and thus sores are produced which are very slow of healing. I have seen ulcers, no bigger than a sixpence, remain unhealed for two or three months.

The temperature is rarely lower than 96°. Dr W. Bechterew of St Petersburg made some experiments upon the cooling of a body in a bath. He found that the body did not cool like an inanimate substance, but reacted by generating more heat

up to a certain degree.* This generation of heat is always proportional to the radiation from the surface of the body as long as this radiation is not more than 90 units in thirty minutes, or three units a minute. If more than this be lost, the production of caloric is not sufficient to prevent the bodily temperature from sinking. In eighteen experiments with idiots and dements, Dr Bechterew found that this relation between the loss of heat and its production in the body did not hold good. Persons so affected have not the same resisting power against the influence of a low temperature, they lose heat rapidly, and the calorification within the body is not so vigorous as with healthy persons.

There is thus in idiots a derangement both in the regulation of the radiation of heat from the surface of the body and the renewed generation of heat within the body.

The unpleasing odour exhaled by idiots comes partly from the secretions of the skin,† and often from the teeth and gums. No doubt the condition of the fluids is in many cases deficient, and we must look for an explanation of the idiotic state, not only to the structure of the brain, but to the relation of the blood to the brain. In many instances the heart is found to be small and weak in its structure. The valves are deficient, sometimes indicated by a murmur, or there is an open foramen ovale. It is rare that pupils, where the circulation remains torpid, as indicated by feeble pulse, cold feet or hands, or other signs, make much progress in education and training. When the general health becomes stronger, the patient turns brighter, more noticing, and improves under teaching. What has been named spurious hydrocephalus, or hydrocephaloid, which is indicated by

* See my 'Russian Retrospect' in *Journal of Mental Science*, April 1882.

† Dr L. Frigerio gives an account of two idiots, who, when they were excited, gave out in the perspiration so strong a smell of musk, that the air through which they moved was quite impregnated with it. No analysis could be taken.—*Zeitschrift für Psychiatrie*, xxxii, 2 Heft, p. 234.

drowsiness or stupor without fever, and with depressed fontanelle, is an illustration of deficient function of the brain without organic disease, dependent on poor blood supply. It occurs in ill-fed, neglected children, and often attends the close of chronic vomiting. Sometimes it disappears very quickly.

The most common accompaniment of genetous idiocy is what has been variously called the keel-shaped or saddle-shaped, or vaulted, or lambdoid palate. It resembles the

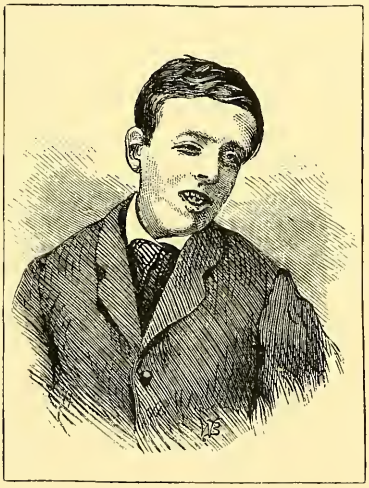
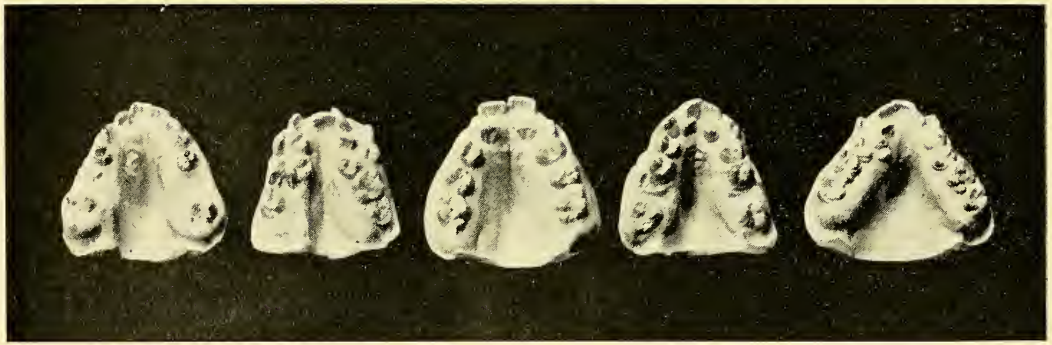


FIG. 1.
Idiot with protruding upper alveolar process and vaulted palate.

impression of the keel of a ship: or it might be compared to the inside of a saddle viewed from below, the pommel being turned backwards, for the arch is sharper behind than in front, and there is occasionally a narrow furrow running along the middle. There are variations in shape, and many degrees from the normal to the abnormal. The palate is narrow, the space between the bicuspids and molars of the opposite side is diminished. In one young woman I find it as small as 1½

centimetre across from the bicuspids, and 2 centimetres between the last molars. The height of the palatal arch is at the same time increased at the expense of the cavity of the nares. In those cases where the narrowness is extreme, the alveolar processes of the upper jaw are advanced, and the protruding teeth, generally more or less decayed, are left uncovered by the upper lip. In most cases of vaulted palate the symmetry of the normal curve of the dental arch is much impaired. The front teeth are generally irregularly placed and crowded ; the molars, on the contrary, have often intervals between them. Sometimes there is a space between the incisors and the canines ; often these latter teeth are inserted on a different plane ; now and then they protrude from the walls of the alveolar processes above the row of the others. The front teeth are often pitted at different points, and sometimes marked by longitudinal lines, by the giving way of the enamel. The teeth, which are unusually late in making their appearance, as in rickets, are very apt to decay early, especially in the upper jaw, so that it is rare to see a complete set of twenty-eight. In some instances there are fewer teeth in the upper than in the lower jaw. The teeth are frequently ill-formed ; sometimes smaller or larger than normal. The wisdom teeth do not commonly appear at all. In many cases the teeth commence to decay two or three years after they have come out. A greenish mould appears at the margin of the gums ; they then rapidly become hollow and break in pieces. Often before idiots have grown up, only two or three rotten stumps remain. This process may go on with great rapidity, three or four teeth being lost in as many months. It is not generally accompanied with much pain, though the gums become swollen, and purulent matter is found round the carious stumps. I found cleft palate in about 1 per cent. of idiots examined. Dr Langdon Down found it in one out of every



Series of Palates of Idiots of mixed Congenital Types, showing very high and narrow Palate, with crowding and displacement of Teeth. Taken from Photograph of Casts made by Dr T. Telford-Smith.

two hundred cases. Cleft palate is not a hereditary deformity, and the causes which produce it do not seem to have any connection with those of genetous idiocy.

Dr Langdon Down remarked that he had taken some trouble to ascertain how frequently the syphilitic teeth, so described by Mr Hutchinson, were to be met with among the feeble-minded; but he found very few among them to be the subjects of congenital syphilis. In those rare cases in which he found syphilitic teeth he always had other evidence of syphilis, and the condition of the teeth was always associated with chronic inflammation of the cornea. He has therefore been led to the conclusion that syphilis is not by any means an important factor in the production of congenital mental disease. 'The honeycombed teeth are perfectly distinct from the syphilitic, and are manifestations of that grave perversion of nutrition which implicates in these cases every tissue in the body.' *

* See Memoir by Dr J. Langdon Down in the *Transactions of the Odontological Society of Great Britain*, vol. iv, No. 1, 1871, on the relation of the teeth and mouth to mental development.

Consult also *De l'Etat de la Dentition chez les Enfants Idiots et arriérés*, par Alice Sollier. Paris, 1887. The clinical history of one hundred cases of idiots is given, with a minute description of the state of the mouth. The book is illustrated with thirty-two woodcuts, most of which are taken from casts of the palate or teeth.

Deformities of the Upper Jaw, by J. Oakley Coles, reprinted from the *Transactions of the Odontological Society*.

A Treatise on the Irregularities of the Teeth, and their Correction, by John N. Farrar, M.D., D.D.S., New York City, 1888, vol. i.

Dr Farrar, in his treatise on the *Irregularities of the Teeth* (New York, 1888), tells us that 'Dr J. W. White and Professor Stellwagen, upon examination of 184 feeble-minded children, noticed that large well-shaped jaws were the rule and not the exception, that they would compare evenly with the same number of similarly neglected people of ordinary intelligence.' A similar position has been taken up by Dr Walter Channing, 'On the Significance of Palatal Deformities in Idiots,' in *Journal of Mental Science*, January 1897. I am not willing to surrender to these writers the results of my twenty-five years' observation. Dr Channing takes for granted that Dr Langdon Down stated that vaulted palates are characteristic of idiocy and even pathognomonic of the congenital form, but that accomplished physician was perfectly aware that the V-shaped palate occasionally, though rarely, occurs with persons of ordinary intelligence. Much

Sometimes the glands of the mouth are enlarged, the tongue corrugated, or the lips striated. Occasionally the tongue seems too large for the mouth. The vaulted palate does not occur in all genetous idiots. In some cases the palate is normal and the teeth good, but undoubtedly the deformity is very common. It occurs, though rarely, in individuals who show no deficiency of intellect. It is known to dentists as the V-shaped palate. In the discussion which followed Dr Down's paper before the Odontological Society, Mr Sercombe, a well-known dentist, said he knew one of the oldest families in the realm in whom every branch of the family had remarkably high V-shaped palates, and at least two members of the family had been in confinement. In this family the chief contraction was between the bicuspids. Mr G. R. Keeling said that 'he had understood Dr Down to ask for information respecting the gradual degeneration which might have taken place in the successive generations of the parents of imbecile children. He knew the grandfather and the mother of an imbecile child, and if the discussion were postponed he should be happy to produce the models of the mouths of the grandfather and the mother, and perhaps of the imbecile child's mouth also.

Dr T. S. Clouston has made extensive inquiries into deformities of the upper jawbone in various classes.* He

of the confusion probably arises from these objectors having made their observations upon all kinds of idiocy massed together, whether genetous, developmental, or traumatic. Had they taken the former variety alone, they would have found the proportion of deformed palates much greater.

* *The Neuroses of Development*, Edinburgh, 1891. For a standard, Dr Clouston reduces the abnormalities into the neurotic and deformed palates. The first has a more Gothic (pointed) arch, with the alveoli running more parallel than the typical, and with a much higher and narrower dome. The deformed palate is of various shapes, all abnormal. The most common form is very high, very narrow, and at the top either V-shaped or saddle-shaped.

It is difficult to make a type out of variations from the normal and typical, and it seems to me that Dr Clouston's neurotic palate has no certain line of division

found that there are over three times more deformed palates amongst idiots and congenital imbeciles than amongst the sane. Only one-tenth of the idiot palates were typical, while over two-thirds of them were deformed. Less than one-fifth of the palates of the average population are deformed. A deformed palate was also found to be more frequent with the criminals in Edinburgh Jail, and with the insane and epileptic than with normal persons. Dr Clouston found neurotic and deformed palates especially common with patients ranked in his class of adolescent insanity, persons who fall insane soon after having completed their bodily growth. From observations of my own, I am inclined to think that an unusually high palate is common with those born deaf. Thus a departure from the normal structure of the palate seems more frequent with all classes of the degenerate. This occurs along with other deviations in the form of the face, but is more frequent than any other. In any case, the saddle-shaped palate is a pretty common correlation or accompaniment of genetous idiocy, and its occurrence affords a strong presumption that the malady was congenital. It is not frequently met with in microcephalic idiocy, nor in cretinism,

from the deformed. Those who wish to make observations of their own should study the appearance of the palate in healthy persons of different ages, after which they will recognise at a glance the deviations from the common type.

Every new writer on the subject rejects the nomenclature of his predecessors and starts a division of his own. Mr Oakley Coles arranges deformed palates by their variations from an equilateral triangle drawn from the molars to the central incisors, which he tells us can be educed from the best type of English jaw. Dr Peterson has no less than seven divisions of the pathological palate. Dr Edwin Goodall has devised an exact method of recording deformities of the hard palate which will be useful in future observations (*Journal of Mental Science*, Oct. 1897). I am inclined to favour the classification given by Dr Talbot. He observes that contracted arches are of two kinds, the V-shaped and the saddle-shaped, all the other varieties being blendings of the two. There are two-thirds more V and saddle-shaped arches among the low vaults than among the high vaults. In the V-shaped there is a gradual narrowing of the dental arch from the first molar to the middle incisor, which are protruded with the alveolar processes. In the saddle-shaped arch the bicuspids are carried inwards and the narrowing commences between the first molar and the bicuspid ; the front teeth do not protrude.

where the teeth are generally bad ; indeed, Professor Lombroso makes flatness of the hard palate one of the most constant characteristics of the cretin skull.* It is equally wanting in the other forms of idiocy arising from causes operating after birth.

Dr Clouston writes that the deformation of the palate occurs during brain growth early in life, probably in utero. Apparently he has arrived at this opinion from an examination of six babies under a year old in the Calton Jail with their mothers, all women of a degenerate class. Of those infants four had deformed palates. On the other hand, Dr Eugene S. Talbot,† who made a most elaborate investigation into deformities of the head and face, states confidently that the highly vaulted palate only comes with their second set of teeth, and appears between the sixth and twelfth years.

Being doubtful of the correctness of this statement, I asked Dr John Thomson, who has good opportunities to make observations. He writes :—' I am quite sure that abnormally high palates are often found in young babies, although, naturally, none quite so deformed as in older children.' In any case a high palate does not appear to be the result of arrested development. I have found that in the human embryo the portion of the palate formed by the upper maxilla and palatal bone was flatter than in the adult. The palate of most monkeys appears also to be flat. That of the gorilla has a trough-shaped form similar to what I have seen in a few idiots ; but this in the ape seems to be dependent upon the prognathism of the powerful upper jaw and the great strength of the alveolar processes ; whereas, in the cases with which I have compared it, the jaw, though narrow, and

* See my ' Report upon some Cases of Microcephalic Idiocy and Cretinism,' in the *Edinburgh Medical Journal*, September 1875.

† See *Dental Cosmos*, vol. xxv. 1893, p. 1210, and his work on the *Etiology of Osseous Deformities of the Head, Face, Jaws, and Teeth.* Third edition. Chicago, 1894.

now and then somewhat trough-shaped, is not generally prominent, the narrow appearance being owing to diminution of the normal breadth rather than to increase of length. In the first years of childhood, however, the dome of the palate is higher and less rounded than it is in the adult. In the fœtal, as in the infantile skull, the pillars of the nares seem proportionally shorter than they are at a later age.

So far from calling in the easy and fashionable explanation of atavism, I should say that this deformity is rather the exaggeration of a tendency peculiar to civilised man. According to Dr C. B. Coffin, this tendency to narrow and vaulted palates, with alterations in the dimensions of the antrum or maxillary sinus and contracted nasal passages, is greatly on the increase, which he regards as a proof of progressive degeneracy of the race. Dr Talbot says that the vast difference between the ancient skulls of North America and of Europe and those of living individuals shows conclusively that the jaws are diminishing in size. Mummery and Nichols found irregularities of the teeth and contracted jaws were rare with savage races, and even with Chinese. It seems to me probable that dentists may be led to exaggerate the proportion of people who have those deformities. It is in no way surprising that they should have frequent visits from such persons, for independently of bad teeth, a high vaulted palate interferes both with proper pronunciation and with the mastication of the food. My own chances of examining the mouths of healthy people are limited, but whenever I have an opportunity I look at the mouths of the brothers and sisters of idiots whom I visit or who are under my care, yet I do not remember to have seen more than two or three well-marked cases of saddle-shaped palates in any one who was not imbecile. This inclines me to believe that this deformity is extremely rare with people of ordinary intelligence. When Medical Officer

of Miss Mary Murray's Institution at Preston, I used to examine all the girls before admission. I noted one child with a vaulted palate and irregular teeth. She did well at her lessons, and was decidedly intelligent.

It does not seem to me that excessive vaulting of the palate can be explained by arrest of development of the sphenoid bone. It is true that the sphenoid is like the key-stone in the nasal arch of the cranium, and in some cases I have observed deformity of this bone, one wing being shorter than the other, but we must hold in mind that the hard palate is separated from the floor of the skull by the pillars of the nares, upon which any downward force would have to be exerted. Dr Talbot states that the vomer is not ossified till puberty. It seems to me that this deformity is the accompaniment, not the result, of the defective development of the brain, one of those mysterious correlations of growth of which we shall have more to mention. The same formative power which has erred in the structure of the brain falters in the architecture of the maxilla. In genetous idiocy the lower jaw is also sometimes irregular, sometimes small and short, or more rarely advancing forward.

Leaving saddle-shaped palates out of consideration, it seems that there is some connection between idiocy of all types and the healthy nutrition of the teeth. I have noted cases in which the teeth have fallen out and decayed in youth, where the idiocy was the result of hydrocephalus, meningitis, or traumatic injury of the brain. It is difficult to understand why bad teeth should be so common with idiots. If I may trust my own observation, lunatics do not seem to have worse teeth than the classes from which they are drawn.

Genetous idiots are seldom well made; they are often short of stature, and long retain an infantile appearance. They sometimes sit or lie in strange postures, which may be

unalterably confirmed by habit. Idiots when asleep in bed commonly lie with the legs bent at the knees, and drawn up towards the chest, recalling the antenatal position. The worst cases have automatic motions, swinging of the body backwards and forwards when seated, alternated lateral movements of the legs and arms when standing, or nodding and wagging of the head. Deformities are frequently met with in different parts of the body, such as wad-shaped fingers, one or two toes of abnormal shortness in each foot, hernia, squinting, rolling of the eyes (nystagmus), fissures of the iris (coloboma iridis), and club-foot.

The external ear frequently takes strange shapes and positions in idiots, as in all degenerates. In photographing criminals for the Scottish Prison Board a portrait of the ear is also taken by means of a mirror held behind it. Professor Schwalbe * and Dr Peterson have proposed methods by which variations may be tabulated. Schwalbe's paper is illustrated with sixteen woodcuts of ear forms. Peterson gives twelve plates and describes twenty-one varieties; his twenty-second category is reserved for 'various peculiarities difficult to classify.' Variations are endless, even in healthy people; no two ears are quite alike in the same person. In concluding his pamphlet on *The Degenerate Ear*,† Dr Eugene Talbot observes: 'That the external ear as an organ is tending to disappear is shown by the feeble power of its muscles, which, except in cases of reversion of special training, are inactive. Changes in the ear by themselves are merely suggestive and not demonstrative of degeneracy, except in accordance with the general rule, that accumulation of defect constitutes strong evidence.'

* 'Ueber die Ohrformen von Geisteskranken und Verbrechern,' *Archiv für Psychiatrie*, Band xxvii, Heft 3. Also the able and comprehensive paper on 'The Stigmata of Degeneration,' by Dr F. Peterson, in *State Hospital Bulletins*, July 1896, Utica, N.Y.

† Chicago, 1896.

In idiots the testicles are occasionally wanting; sometimes there is only one. The hair on the pubis is generally scanty.

Sometimes, as Dr Ludwig Meyer observed, the difference in length between the upper and fore arm, and in the leg above and below the knee, is less than the average, recalling the fœtal condition of the third month.

Slavering is common, sometimes due to irritation through the chorda tympani, at other times apparently due to pure apathy and negligence in swallowing saliva.

Rumination, though in all cases a rare affection, presents itself more frequently with idiots than with normal persons. It may begin with some obstruction to the downward passage of the food,* probably combined with weakness of the cardiac orifice of the stomach. In the feeble-minded, the gulping up of the food would not be so much resisted, as they readily fall into negligent habits.

I once saw an imbecile boy with whom the umbilical cord had entered close beside the urethra. There was no navel on the belly, the boy had incontinence of urine, and the scrotum and testicles had sloughed away. He was in a very miserable state, with ulcers and excoriations around the urethral orifice.

The dyscrasy which accompanies or causes genetous idiocy affects both the constitutional vigour and the symmetrical growth of the frame, though not equally in every part. Nature works like a bad sculptor, who fails to give the proper form sometimes to one member of the body and sometimes to another. There are errors, now here and now there; and some parts are more happily shaped than others.

* See Dr Stievers in the *Finska Läkaresällskapets Handlingar*, No. 5, 1889. Dr Cantarono studied this affection in four idiots, two imbeciles, and three patients deeply demented. No uneasiness followed the process (*La Psichiatria*, Fasc. iii.-iv, 1889). See also Alt (*Berl. klin. Wochenschrift*, Nos. 26 and 27, 1888) and Boas (No. 31 of same Journal). In the *Archives de Neurologie*, vii, 1884, the reader will find a paper on this interesting subject by Doctors Bourneville and Séglas.

Occasionally, however, genetous idiots are strong and good-looking, with well-formed heads good teeth, and no deformities whatever.

Varieties—Mongolians.

Dr Langdon Down and others have pointed out a Mongolian type amongst genetous idiots. Many of them are dwarfish, and have broad faces and squat figures, and a variety has been described and studied, offering some of the most striking features of the Tartar * or Mongol.

The most common characteristics are :—The head is somewhat small and obtusely rounded ; the antero-posterior and lateral measurements are nearly equal ; the features are broad ; the upper superciliary margin of the orbit is obliquer than usual, giving the upward slant to the outer droop of the arch of the eyebrows, so striking a feature in Chinese drawings ; the inner eyelid comes down towards the nose with a more rapid slope ; the bridge of the nose is flat, making the unusual distance between the eyes more readily noticed ; the nose itself is short and premorse ; the tongue is rough and hacked ;† the figure is dwarfish and squat, the hands and

* 'Report of a Case, with Autopsy,' by John Fraser, M.B., with Notes on sixty-two Cases by Dr Arthur Mitchell, Commissioner in Lunacy—*Journal of Mental Science*, July 1876. The patient was a short, slenderly made woman, aged forty years. The intellect was equal to that of a child of about a year old. The principal physical peculiarities were :—The third and fourth toes were unusually small, but symmetrical, on either side. The skull was very light, and asymmetrical. The internal fossæ were unequal. The sutures were remarkably open, the frontal being still persistent ; and there were five Wormian bones. The nasal bones were absent. The brain weighed 40 oz. It was apparently healthy in structure ; the configuration was asymmetrical. There was bulging in the right frontal and left parietal regions, and slight flattening in the left frontal and right parietal lobes, with asymmetrical form in the covering bones. The gyri were simple ; anteriorly many of the sulci were very deep. The heart was small, and the aortic valves were fenestrated. Engravings of the skull and brain of this case will be found under the heading of Pathological Anatomy.

† This unevenness of the tongue is owing to the greatly-increased size of the fungiform papillæ, and the furrows are simply owing to the cessation of these enlarged papillæ, at certain lines. On examining these mushroom papillæ with the naked eye, they are found to have an outer margin, somewhat translucent in the

feet are short and broad. The testicles are generally small or not apparent, or only one has descended. Frequently they are found to be younger children of large families, the product of exhaustion.

In the mother of a Mongolian idiot I noticed the characteristic enlargement of the papillæ of the tongue. Dr John Thomson of Edinburgh, who has made some valuable observations on idiocy in early childhood,* informs me that in these idiots the papillæ of the tongue are not enlarged during the first two years. The enlargement comes after this, and at four years of age it is complete. Such children rarely raise the head before the sixth month, do not sit up before the twelfth month, and are two years old before they walk. Dentition is late.

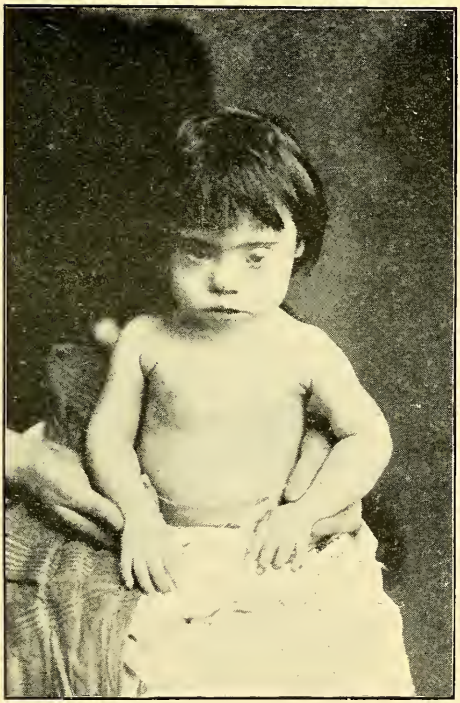
This portrait is from a photograph given to me by Dr John Thomson, from whom I have the following description :—

'A. W., first seen when sixteen months old. No difficulty at birth, backward in every way, cried little, constantly sucked her tongue. First two teeth appeared at six months, none after; characteristic Mongolian appearance. Head brachycephalic, measuring $16\frac{3}{4}$ inches in circumference = 425 millimetres; the tongue usually projects out of the mouth, was not hacked. Over and around the tricuspid area there was a loud and harsh systolic murmur. There was no cyanosis. The child's health was delicate during the next two years. She died near the end of 1895 of measles and inflammation of the lungs. At the post-mortem examination, besides the signs of double broncho-pneumonia, there was

sunshine, and the disc of deep red generally in the centre, or sometimes a little to one side of the pale circumference. This appearance is easier seen with a lens, and in looking at it with a larger power the round red disc is dissolved into a number of separate red dots. I have found this appearance of the tongue well marked in one idiot at least who has not the Mongolian caste of features.

* Some of them are to be found in his paper 'On the Diagnosis and Prognosis of Certain Forms of Imbecility,' in *Scottish Medical and Surgical Journal*, March 1898.

PLATE II.



Mongolian Idiot.

found incompetence of the tricuspid valve, due to intra-uterine endocarditis and double broncho-pneumonia. There was no sign of tubercular disease. The left lobe of the lung resembled the right in having three lobes. Permission was not obtained to examine the brain.'

The use of the accompanying portraits of two Mongolians was kindly allowed to me by Dr T. Telford Smith, Medical Superintendent of the Royal Albert Asylum.

In many cases the skin is wanting in softness and suppleness, the complexion is dusky or branny; the hair dry and stiff, sometimes with downy hair about the forehead, cheeks, and chin. In general these Mongolians are placid and good-natured, much given to mimicry, and they have a good deal of placid obstinacy about them. Some of them are fearful, or irritable. Their intelligence is generally of a low grade, and the power of co-ordinating motions deficient. Dr Down thought that they were the heirs of a tubercular degeneration; but I have seen cases where all consumption in the family was denied, and I have come in contact with several such children from the Hebrides where phthisis is very rare. Certain it is that they are prone to fall victims of consumption. Few grow up, and these generally kept apart; if sent into a big asylum for idiots where the germs of tubercle abound, they rarely escape infection. Several years ago I saw a dwarfish boy just brought by his mother and elder brother from Australia. They had read some of those reports and chairmen's addresses which resemble the boastful advertisements of a showman, and had taken the little creature to Britain, in the hopes, as they expressed it, that he might be taught to earn his bread. The opinion that I expressed did not please them. It seemed to me that they would go where more was promised, and I heard that the little boy was dead before they had set out to return to Australia.

These Mongolians are to be seen in all asylums in Europe

and North America in the proportion of about three or four per cent. to the other idiots. The Mongolian type is sometimes seen amongst children, or indeed grown up people who are not deficient in intelligence. In the mother of one of these idiots I noted the characteristic enlargement of the papillæ of the tongue. The traits of the Mongolian idiot are observable from birth. They form a very distinct class. Such curious correlations as the Mongolian features and the rough papillated tongue, when persistent, like Darwin's deaf cats with blue eyes, and the Russian and Burmese hairy men with only two or three teeth, ought not to be lost sight of, and may yet help to guide us to some new discovery or generalisation in the etiology or pathology of idiocy.

Dr Down has tried to go farther, and found a classification upon physiognomical traits; he has seen idiots who arrange themselves round the Ethiopian and Malay varieties. I have, like him, seen an American Indian type, and also what might be styled the Grecian aspect of the face, the forehead and the nose running in an almost uninterrupted slope.

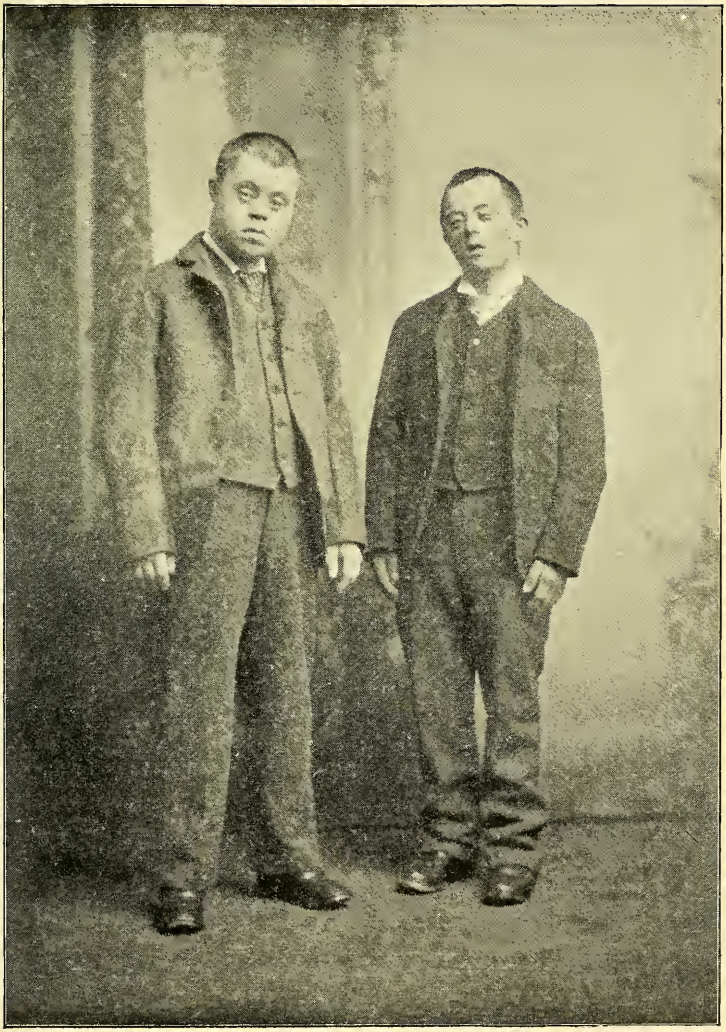
Dr Wilmarth,* who examined five cases of Mongolian idiocy, observes that 'they were all of good size for imbecile brains, the pons and medulla alone being very small, weighing in each case about one-half ounce, whereas the usual weight is nearly twice as much. The cerebral vessels are inclined to be much thinner than in healthy brains. In some places, evidences of old arteritis were discovered.' . . . 'The defective nutrition and circulation of these children lead one to suspect that the defective condition of the vessels may be a general condition. From the small size of the pons and medulla in every instance, there seems to be a strong probability that the low nutrition, and possibly the other anatomical peculiarities of this group, may be due to the imperfect development or absence of certain cell-groups in this region.'

* 'Report on the Examination of One Hundred Brains of Feeble-Minded Children,' by A. W. Wilmarth, M.D., Elwyn, Pa., *Alienist and Neurologist*, October 1890.

PLATE III.

Mongolian Idiocy. Girl, æt. 3 months.
(Given by Dr J. Thomson.)

PLATE IV.



Mongolian Imbeciles.

Amaurotic Genetous Idiocy.

This peculiar form of born idiocy is principally known by the writings of Dr Sachs * of New York. Several children by the same parents have been affected, and of the twenty-two cases recorded fifteen occurred in eleven families. Thirteen were girls. In eighteen of these cases the parents were Israelites; in four the race is not mentioned. It may be here noted that Dr Buschan has gathered information rom many countries showing that with the Jewish people ıental derangement is from four to six times as frequent with the Gentiles. Amongst the 341 deaf-mutes whom ›breich found in Berlin there were 41 Jews, a propor- ion of one deaf person to every 368 Israelites, while with .he Gentiles the proportion was one deaf-mute to every 1477. Nervous diseases are also very common, and many Jewish women are hysterical. There is a neurotic strain through the whole race of Israel. The general history of this affection seems to be: The infant is born of parents pparently healthy; there is no record of syphilis or convul- ›ions, and nothing wrong is noticed till from three to six nonths, when the child begins to droop. The intelligence, ınstead of growing, rather falls off into absolute idiocy; the child does not lift its head; the limbs are weak, then become paretic, flaccid or spastic. The reflexes are increased as a rule, though sometimes absent. The child, at first attracted by light, ceases to notice visible objects, and on the eye being examined through the ophthalmoscope a white patch is observed in both retinæ at the macula lutea, with a circular cherry-red spot in the centre of the patch. Later on the

* See his paper in the *New York Medical Journal*, May 30, 1896, and in the *Journal of Nervous and Mental Disease*, September 1887; also a paper by Henry Koplik, M.D., in the *Archives of Pediatrics*, October 1897, New York, describing two cases.

retinæ and optic nerves become atrophied, and the child is completely blind. The hearing at the same time is good. The child wastes away and dies about the age of two years. In the first case described by Dr Sachs the brain presented striking abnormalities to the naked eye, as may be seen in the engraving in the *Journal of Nervous Disease*. The fissures were broad, deep, and confluent, and the convolutions were narrow and simple. On the left side the island of Reil was uncovered. The vessels seemed of normal calibre and number, and there were no traces of encephalitis, nor any change in the neuroglia; but the large and small pyramidal cells, and, indeed, nerve cells of normal appearance, were rare; in some there were a distinct nucleus and nucleolus entirely surrounded by a detritus-like mass; in many the nucleus and nucleolus were entirely wanting. The nerve fibres could not be traced as far towards the periphery as in the normal cortex; the transverse fibres in the outer barren layer could not be made out. Altogether there were no traces of degeneration, but a genetic condition pure and simple, affecting the highest nerve elements. In the next case, a sister of the first patient, the abnormalities in the fissuration of the brain did not occur, but the changes in the cortex were found to tally. There was also observed degeneration of the pyramidal and cerebellar tracts of the cord. A third autopsy by Dr Kingdom gave similar finds in the grey matter of the brain, and sections of the upper part of the cord showed marked descending degeneration.

Diagnosis and Prognosis.

Genetous idiots form a large class, generally twice as large as any other, though there is very little doubt that in some districts they are proportionally more abundant than in others. To recognise a born idiot in the early months of

infancy requires skill. If the child does not suck well, lolls his tongue out, has no grasp, or a feeble one, fails to react to sensory impressions and sights, one may suspect something wrong, especially if the family history cause misgiving. Place the child on the floor, see if he tries to right himself or cries to be taken up. Note at what month he holds up his head, sits up, and begins to kick, creep, or walk. Extreme smallness of the head, or commencing hydrocephalus or Mongolian characteristics of course help. In any case the situation requires tact and management. Parents in general are extremely slow to recognise idiocy in their family, and are apt to take offence should their medical adviser arrive at the truth too far in advance of their own suspicions. In any case he should be on his guard not to confound an idiotic with a deaf child, or with a simply backward or a stupid one. It seems strange that an imbecile child could be mistaken for one simply slow in speaking, but apparently this is frequently done; at least many parents have assured me that when they have consulted the doctor about their child, he told them that it would all come right. 'Only wait for a year,' 'wait for two years,' 'wait till he is seven.' 'He possesses all his faculties.' The parents often give misleading information about the child's capacity. They will say, 'He is very clever, only he does not speak; but he can understand everything that is said to him;' and when this statement is tested, it will be found that the child can only execute some very simple command, such as to shut the door, or to pick up his hat. Sometimes the words have to be eked out with pantomimic signs, so that often the child is found not to understand more than a score of words. This, however, does not always prevent the parents making remarks disparaging to the doctor's skill, when, after waiting for years, they apply to some other medical adviser, from whom the sad truth comes out that they have been feeding themselves on false hopes.

A medical witness, if examined about a pauper idiot, may be asked whether he thinks the deficiency to be a congenital one; for if this can be held, it generally fixes the settlement upon the parish of the father, or the mother if illegitimate. In such cases the witness should learn what he can of the medical history and look for the stigmata of hereditary degeneration which have been described.

The general prognosis of genetous idiocy is better than in most other classes.* Yet, as it is a large class, it comprises some of the worst and some of the most improvable cases, solitary idiots as well as imbecile and feeble-minded children. We must, therefore, in forming a prognosis, have recourse, in a great degree, to those general tests which are also of use in examining other kinds of idiocy. We ought, by carefully put questions, to ascertain the amount of intelligence existing, the degree to which speech is exercised, the knowledge of number possessed by the child, as well as the power of attention and of memory. It is a bad sign when the grasp is loose or readily relaxed, when the eye cannot be fixed, and when there are automatic motions. The power of muscular motion, as shown in walking over the floor or across a plank, or, in better cases, of carrying a vessel full of water, is a surer test than that of tactile sensibility. Congenital idiots of the lower type are often very deficient in these respects. It is rare that cases where the circulation remains torpid, as indicated by feeble pulse, cold feet or hands, or other signs, make much progress in education and training. On the contrary, the prognosis is

* Dr Langdon Down writes: 'We have learned by experience this important fact, that the child who has been born with defective intellect is more susceptible of improvement by physical and intellectual training than the child who has been born with full possession of his brain-power, and has afterwards been deprived thereof.'—*Op. cit.*, p. 12. Dr C. T. Wilbur, in the Tenth Report of the Institution for Feeble-Minded Children at Jacksonville, Illinois, writes: 'Congenital idiocy furnishes the most improvable subjects for the school-room and for training in useful occupations. The majority of them in the degree of mental deficiency stand upon the plane just below the lower grades of ordinary intelligence.'

good where the child is active and vigorous, noticing things, where he has begun to speak before six or seven, and has got a firm grasp and a normal amount of tactile sensibility, and the faculty of attention capable of being sustained.

Illustrative Cases.

I had once an opportunity of observing two congenital idiots, a boy and a girl, who were twins. It might therefore be presumed that their mental deficiency was owing to the same causes. The father's mother had been insane, the father himself was much addicted to drinking, and the mother attributed the idiocy of the twins to his coming in drunk and threatening to kill himself when she was in the fifth month of gestation. The wife's mother died of epilepsy, though long after the birth of her daughter. The mother of the twins has had five other children, one of whom, the youngest, is feeble-minded.

These unfortunate twins were both well made, without any peculiarity of appearance, save that the girl was very short for her age. When nine and a half years old she was only 3 feet $7\frac{1}{2}$ inches in height, while her brother was 9 inches taller. Neither of them had a vaulted palate. The size of the head was much alike in each;* but the frontal portion was larger than the portion behind the ear in the boy.

The boy was fair-haired, while his sister was red-haired.

* The following measurements of the head were taken when they were nine and a half years old :—

	Boy.		Girl.	
	Cent.	Inches.	Cent.	Inches.
1. Antero-posterior	$33\frac{1}{2}$	$= 13\frac{1}{2}$	33	$= 13$
2. Circumference	51	$= 20\frac{1}{8}$	52	$= 20\frac{1}{2}$
3. Transverse	35	$= 13\frac{7}{8}$	$34\frac{1}{2}$	$= 13\frac{1}{2}$
Sum . .	$119\frac{1}{2}$		$119\frac{1}{2}$	
4. From tragus to middle of forehead .	$12\frac{1}{2}$	$= 5$	$11\frac{1}{2}$	$= 4\frac{5}{8}$
5. From tragus to occipital tuberosity .	12	$= 4\frac{3}{4}$	12	$= 4\frac{7}{8}$

He appeared to be of the phthisical, while she was of the scrofulous diathesis. They were both subject to attacks of bronchitis, and when the one caught cold the other rarely escaped. When between five and six years of age he had frequent epileptic fits; his sister never had any. Notwithstanding this the boy was one of the most improving cases in the house, while the girl was one of the least so. She remained a mute, of short stature and infantile appearance, her intelligence about equal to that of a child of fourteen months. All that she could do was to go simple messages and string beads; but the boy learned to read, and write, and count, to sew and knit, and improved so much both in general intelligence and in bodily growth, that, if it could have been managed to have kept him two or three years beyond his term of five years, I think he might fairly have been discharged as passed out of the stage of imbecility. He was only thirteen years old when he left us, nor did I ever hear what became of him.

B. E. was born of healthy parents with no known neurotic tendency and no accident at birth. He was one of six children, three of whom were boys, who were all deficient in intellect, the girls not so. The head was of normal size, as well as that of another brother examined.

B. E. was weakly in infancy, but grew to be strong before passing out of the first years of life, though he slavered up to the age of twelve years. He began to walk and speak when about two years old. The palate was somewhat high, long, and trough-shaped, and the teeth irregular, $\frac{17}{16}$. He was sometimes obstinate and sullen. He could never master the alphabet, but learned to work well. He was extremely faithful and attentive, and very zealous in guarding property, such as preventing the fruit in the garden being stolen, and would have flogged the little boys severely when he caught them at such depredations. He learned to do out-door work, and

look after a horse, and is now a strong young man, earning 14s. a week as a surfaceman on the railway. His elder brother, who seemed at first to promise more, did not improve so much under training.

X. B., nine years of age, a twin born at full time. His parents are healthy. The mother is apparently a strong woman, careful of her household, and fairly intelligent for her situation in life. The father is a labourer. He has a sister insane. X. B. was very small at birth, and there was great difficulty in getting him to suck. He began to walk when two years of age, and has only commenced to speak within a few months. He is small of his age; a brother two years younger is taller and broader than he. He is an out pupil, and his sister brings him to school. She was always the bigger of the two, and is of the average intelligence of her years. They resemble one another in no respect save in the colour of the hair. His height is 45½ inches. His sister's height is 50¼ inches. His head is small and brachycephalic. The ears are simple, with a small lobe; the palate is somewhat vaulted; teeth $\frac{12}{12}$; four teeth above and seven below are decayed. The sister's ears are better formed, the lobe is larger, and she has only one tooth decayed. The following are the head measurements in each :—

	X. B.	His Sister.
Antero-posterior	32½	35
Circumference	48	52
Transverse	31	34
Sum	111½	121
From tragus to glabella	12	14
From tragus to occipital protuberance	11	70

He has the Mongolian type of countenance, with slanting eyebrows, tongue with enlarged papillæ, short nose with shallow bridge and considerable distance between the eyes,

$3\frac{1}{2}$ centimetres. The mother has four other children, none of whom resemble X. B., save that two of them have got a considerable breadth between the eyes. The boy is generally obedient, docile, and good-humoured; but slow, torpid, and very shy. He does not appear to be fond of music. He uses very few words, and, although he has only been a few months at school, has made a marked improvement in intelligence.

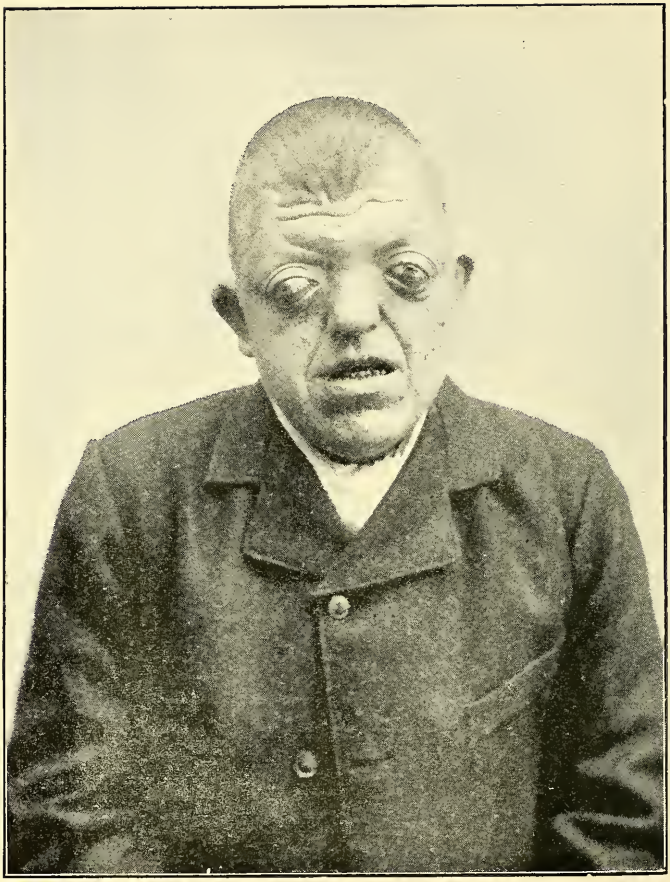
I saw the young man whose portrait is here given at the Custodial Asylum for Imbeciles at Ebberödgaard. The photograph and description were kindly given to me by Dr A. Friis.

O. O., son of poor peasants with no record of insanity, nervous disorders, or deformities in the family. He is the fourth of eight children; his brothers and sisters healthy; was long in learning to walk and to speak. He never had epileptic fits; slavers by day as well as by night; has a thick utterance; quiet and good-natured. When fourteen he was sent to the school for imbeciles at the Gamle Bakkehus, and four years afterwards was shifted to Ebberödgaard. He improved under training, and has learned, in spite of his webbed fingers, to do a good deal of joiner's work. Height $168\frac{1}{2}$ c., weight 58 kilogrammes.

	Head Measurements.
Circumference	55 c.
Longitudinal	39 c.
Transverse	35 c.
	129 c.

Such a wandering of formative force outruns imagination. The large prominent eyes, injected from imperfect closure of the lids, have divergent axes; the sight is good; the deep furrow across the forehead, the rough, pustulated skin, the shapeless nose and the broad lips, give a portrait of deformity most unpleasant to those not accustomed to deal with such

PLATE V.



O. O., Genetous Imbecile.

PLATE VI.

Hands and Profile of O. O.

unfortunates. The teeth are irregular, the middle incisors of the upper jaw are in advance of the others ; the mucous of the palate is divided by longitudinal folds, and there seemed some deficiency of the palate bone behind ; the respiration is nasal. The second engraving exhibits the state of the hands. The feet are short and broad, the first metatarsal bone is wanting on both feet, and the first phalanx of the great toe is implanted in the angle between the second metatarsal and the internal cuneiform. The four outer toes have completely grown together with the soft parts. The feet are short and broad, with high insteps.

The Development of the Infant's Brain.

Unfortunately our knowledge of the structure and mechanism of the brain does not throw much light upon its functions. When one learns the anatomy of the heart he is at no loss to understand how it acts as a pumping machine. With a further knowledge of the arteries, capillaries, and veins, the circulation of the blood is made clear, and one can at once understand how anything out of gear would affect it. In like manner, when one knows the structure of the eyeball and the laws of light, he readily comprehends how any change in the visual apparatus should affect the sight.

Even a knowledge of the anatomy of an organ like the kidney takes us far into its physiology. But after looking through many microscopes, and reading hundreds of pages describing the morphology and histology of the brain, we are scarcely any wiser as to how its structure is adapted for its complicated functions. It is like a scroll which we cannot decipher. We know that it has a meaning, and that if the characters were altered or the lines transposed the significance would be different, or there would be no significance at all. The utmost which we have made out amounts to this. If the

three, five, or eight layers described as making up the cortex of the brain were transposed, or if some layers were wanting, or if the minute structure and the peculiar arrangement of the nerve cells, pyramidal, giant, spindle, spider, and neuroglia, the nerve fibres, molecules, and granules, and the distribution of the vessels were made different, the sensory and mental manifestations would be deranged in one way or another. Moreover, we know that lesions affecting the growth of the brain in early life have a decided effect upon the mental power. Nevertheless it must be admitted that researches on the structure and development of the brain during the last twenty years have enabled us to see a little more clearly how it discharges its function, and a consideration of the difference between the structure of the brain of the infant and of the adult will help us towards understanding the operation of the various causes of idiocy.

When a child comes into the world, though he already has all the primary and many of the secondary convolutions, he has only one-third of the volume of his brain; he acquires the second third before twelve months are over, and the rest between that time and the twenty-first year. In the first year of life the brain grows about 450 grammes, more than 1 c.c. a day. By far the greatest growth occurs in the first two years of life. The development of the skull goes on from birth to the seventh year. About this time the cranium has well-nigh gained its full size, and there is a pause till the commencement of puberty, when a further period of increase begins, which goes on till the completion of the growth of the cranial bones. The brain in the new-born infant is so soft that it is difficult to examine the structure. It has been observed that those portions of the brain which in the adult are the driest, contain in the child the greatest proportion of watery fluid.

The first elements are granular and fatty cells. Dr Fuchs

found the pyramidal cells recognisable in the brain of the new-born infant, and Deiters cells in their normal arrangement in the brain of the child five months old. He found the typical fifth layer in the cortex of the child aged eight months.

For a long time microscopists paid scant attention to anything but the larger nerve cells, to which they were pleased to assign all the most important functions of the brain. Availing himself of the new processes of dyeing the tissues, Tuczek had the merit of calling attention to the nerve fibres and the changes in their structure in disease.

The development of the spinal cord is in advance of that of the brain. Microscopists have assumed that the appearance of the axis-band or cylinder or marrow is a proof that the nerve fibres are sufficiently formed to take on their function. In the new-born child, the main motor and sensory tracts of the spinal cord are already developed, and the axis-bands also appear in the vermiform process and flocculus of the cerebellum, but the greater portion of the fibres of the cerebrum are not yet marrow-holding.* The first axis-band fibres occur in the posterior roots of the spinal column and of the bulb. At a later date they can be traced with surprising distinctness from their more opaque outline, amongst the half-formed fibres and granular and fatty cells which then compose the white substance of the brain up to the median gyri of the cortex. These axis-bearing nerve fibres are held to transmit the impressions of touch and of heat and cold, which form the first sensations of the infant, the foundation of its personality, and the point of departure of the motor impulses to the muscles. In the spinal cord the motor tracts are developed before the sensory ones, while in the brain the sensory tracts are developed before the motor. After the

* For these facts I am indebted to the researches of German microscopists, especially to Professor Flechsig in his *Gehirn und Seele*, Leipzig, 1896, and *Die Localisation der Geistigen Vorgänge*, Leipzig, 1896.

sensory fibres of touch and bodily feeling, axis-band fibres are observed in the olfactory tract about the end of the ninth month, running to the olfactory spheres in the base of the frontal and temporal regions of the brain. Next are developed the optic tracts. About the second week after birth, bundles containing the axis-bands can be traced from the retina to the visual area in the occipital lobe. In infants born before the full time the axis-bands of the optic tract are not formed, consequently the faculty of vision is not yet in exercise.

Last of all are developed the auditory tracts, as hearing is the last sense developed in the child. When two months old these fibres can be traced from the nervus cochlearis to the first temporal gyrus. Thus the sensory tracts and sensory areas in the cortex are formed, while the remaining two-thirds of the brain are still in an immature state, destitute of axis-band fibres. These areas comprehend the Denk-Organe (Flechsig). A month after birth the 'Think-organs' are still immature, and even in the third month they show such a poverty in axis-cylinders that they can readily be distinguished from the other areas. These different sensory areas developing independently of one another are not adjacent; but after a month of infantile life innumerable association fibres stretch both in the longitudinal and transverse directions, meeting one another through the whole brain. The motor paths leading from the median convolutions through the corona radiata and optic thalami have axis-band fibres during the first month of infantile life. Those coming from the lower portion of the third frontal are later in their development.

Dr Vulpius * has studied the fibres which horizontally traverse the surface of the hemispheres, which he calls the tangential fibres. These appear on the outer layer of the

* *Archiv für Psychiatrie*, Band xxiii, p. 775.

cortex in the fifth month of life; in the seventh month the tangential fibres can be found in the deep layers; while in the layers between, the cross fibres only appear after a year. In the child of eight, and even perhaps of seven years, the fibres of the cortex and medullary substances are complete in number and calibre, and have taken the same arrangement as in the adult.

It is during the development of the brain and nervous system before birth, and during these first years of growth, that malnutrition and perverted action occur, which result in defective mental power.

Thus the study of development and the evolution of the sensory faculties in childhood throw light upon one another, and the knowledge gained is to a certain extent confirmed by observations in disease.

Pathology—Chemistry.

In his analysis of the brains of the insane, my predecessor at Larbert, Mr Addison,* found in a congenital idiot the greatest quantity of phosphorus, and in the brains of two congenital idiots the least quantity of fat. The increased proportion of phosphorus is not what would have been anticipated; but the deficiency of fat is worthy of attention. It was also found in a case of dementia and one of melancholia. The proportion found was below that in the brain of the new-born infant. Mr Addison found that the brain of the foetus is also deficient in fat. In the brain of an idiot described by Mr Bradley,† after a careful microscopical examination nothing abnormal could be found in cells and fibres; nor could

* 'On the Chemical Pathology of the Brain,' *Journal of Mental Science*, July 1866.

† 'Description of the Brain of an Idiot,' by S. Messenger Bradley, F.R.C.S., Lecturer on Human and Comparative Anatomy, Royal School of Medicine and Surgery, Manchester, in the *Journal of Anatomy and Physiology* for November 1871.

Professor Roscoe, who analysed the brain, discover any departure from, or want in, its most important chemical constituents.

Pathological Anatomy.

The principal anomalies met with in the skull of genetous idiots are flatness of the head behind, a rapid slope of the clivus, an osseous rim round the foramen magnum, asymmetrical size of the cavities on each side, irregularities in the wings of the sphenoid, and differences in the size and shape of the jugular and other foramina. Some idiots' skulls are slender and have a general appearance of having been poorly finished; sometimes the walls are thicker than usual; but these abnormalities are not constant, and often the skull is regular both in structure and capacity.

It is to the brain that we must look for an explanation of the mental deficiency. In this field of research the pathological anatomy has still much to do. In genetous idiocy, abnormalities in the form of the encephalon are often visible to the naked eye. The most common are: the convolutions are coarse and simple, with few secondary folds, or the gyri are small, slender, and curling (microgyry*). Sometimes a few convolutions, especially in the upper parts of the frontal and parietal lobes, are notably narrower than the rest. There are at the same time alterations in the amount and in the arrangement of the underlying white substance. Heschl, Chiari, and Jelgersma† consider the microgyry may be caused by a deficient growth of the white substance; apparently a wide surface is required for the functional power of the enveloping cortex. This is gained by throwing it

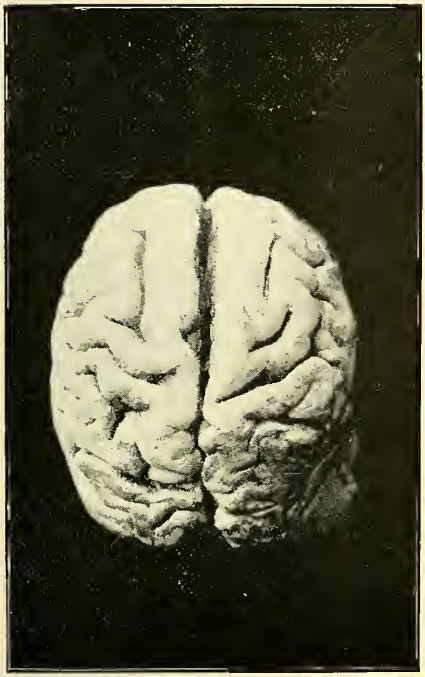
* See 'Casuistische Beiträge zur Kenntniss der Microgyrie,' von Dr R. Otto, *Archiv für Psychiatrie*, Band xxiii, p. 153.

† Das Gehirn ohne Balken, von G. Jelgersma, *Neurologisches Centralblatt*, No. 6, 1890.

PLATE VII.

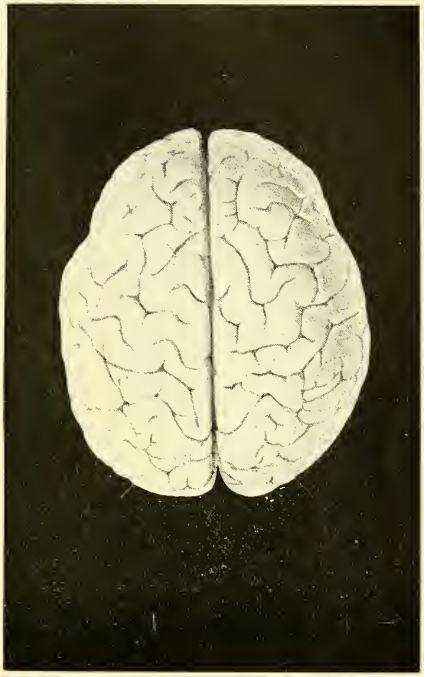
Hands of Mongolian (given by Dr Telford-Smith.)

Fig. 1.



Brain of Mongolian, from a Photograph given by Dr T. Telford-Smith.

Fig. 2.

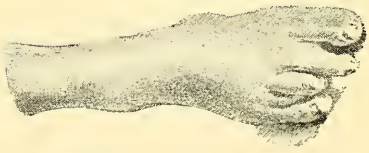


Mongolian Brain.

Fig. 3.

Skull of Kalmuc Idiot.

Fig. 4.



Foot of Kalmuc Idiot.

into folds. Jelgersma observes that as a rule the thinner the cortex the more complicated are the gyri. Thus a diminished amount of the white matter may influence the form and even the quantity of the grey matter of the brain.

He states that in those rare cases in which the corpus callosum is absent the failure in the transverse white fibres leads to atrophy of the substance of the centrum ovale and increased folding of the convolutions (microgyry).

Confluence of the fissures is sometimes a marked feature in the idiot's brain. In a case recorded by Schroeder van der Kolk, all the convolutions in front of the central furrow or fissure of Rolando were remarkably short; but those lying behind were of the ordinary size. The radiating convolutions of the island of Reil have frequently been observed to present a smooth surface, even when the imbecile possessed the power of speech. The occipital lobe, in some cases, fails to cover the cerebellum. The cerebellum in size and weight is often larger in its ratio to the cerebrum. In the idiot the cerebrum is generally lighter; in some cases, however, it is up to and even beyond the normal weight. There are asymmetries of the base of the brain, often accompanied by irregularities in the sphenoid and occipital bone, proofs rather of a disordered direction of formative powers than explanation of the mental hebetude. I have thrice seen the quadrigemina small, and in one case found the corpora geniculata, in another the pituitary body, to be wanting. Sometimes one or other of the commissures is absent, or there is no corpus callosum. I have seen but one instance of this rare deficiency, in a woman who was deaf and insane. Dr Alexander Bruce has made an extensive collection of the cases on record of the absence of the corpus callosum.*

* See his paper in the *Proceedings of the Royal Society of Edinburgh*, vol. xv, pp. 320-341. This subject is considered in the last chapter of my book, *The Blot upon the Brain*, 2nd edition, Edinburgh, 1893.

With some there was profound idiocy, in others merely a moderate degree of mental weakness, and sometimes even this did not appear. 'Case of Solly (*The Human Brain*, London, 1826, p. 433), a boy, aged seventeen, always mentally weak, but took delight in reading religious books; was benevolent, docile, sleepy, inclined to stumble and fall. Besides the want of the corpus callosum, a cyst was found in the brain. Case of Paget (*Med.-Chir. Trans.*, vol. xxix. 1846, p. 55), girl, aged twenty-one, amiable and childish disposition, showed no striking peculiarity, good memory, actions rapid and inconsiderate, speech sharp and abrupt; the corpus callosum was quite rudimentary, being represented by a thin band of horizontal fibres; the septum and middle part of the fornix were absent. Case of Mitchell Henry (*Med.-Chir. Trans.*, vol. xxxi. 1848, p. 239), a boy, aged fifteen, gentle, but slow to learn, dull, sleepy, much disturbed when rapidly spoken to; the brain normal, the corpus callosum represented by a horizontal band of fibres, 1½ inch broad, the septum and middle anterior part of the fornix absent.'

There is a case reported by Dr J. Sander,* where a woman of twenty-one, who died of pericarditis, was found entirely to want the corpus callosum. She had no trace of mental derangement. Professor Malinverni Germano† of Turin published a remarkable case of deficiency of this structure. A subject was brought into the anatomical rooms for demonstration of the corpus callosum, when it was found that the very organ in question was wanting. The gyrus fornicatus and the septum lucidum were also absent. The convolutions of the brain were quite normal; but the anterior commissure was somewhat larger than usual. The man's antecedents were quite well known; he had served eight

* *Zeitschrift für Psychiatrie*, Band xxxi, Heft 3.

† Cervello di uomo mancante del Corpo Calloso, Turin, 1874, quoted in *Psychiatrisches Centralblatt*, No. 7, 1872.

years in the army, and had afterwards lived by field labour. He bore the character of an industrious, quiet, and tolerably intelligent man. No mental deficiency had been suspected during his life. Dr G. Eichler has published another case,* a man who died at the age of forty-five. The corpus callosum, fornix, and soft commissure were wanting, the anterior commissure somewhat larger than usual, and there were some abnormalities in the gyri, especially the temporal and occipital. There was nothing particular noted about his intelligence. He could read, write, and count. There is mention of an idiot girl of eighteen years of age, in whom the corpus callosum was also wanting. The function of the corpos callosum is unknown, and it is clear that its absence, uncomplicated with other deficiences, is not sufficient to cause idiocy. In fact, its absence is generally accompanied by other abnormalities in the brain.

Shrinking of the convolutions, especially of the frontal ones, is not uncommonly observed. The following case was thought to be one of genetous idiocy, complicated in early years with occasional fits. The boy was peevish in disposition, the intelligence that of a child of a year old, mute, but able to hum tunes. Though the appetite was voracious, the boy was always thin and pale, and he died at the age of sixteen from mesenteric phthisis. The aortic valves were incompetent; the palate was high and cleft behind. He had a supplementary eye-tooth on the left side. The head was large and finely formed, but flat behind; the skull-cap was thick, and all the sutures closed, or nearly so. The encephalon weighed 53 ozs. On opening the skull-cap there was seen a clear, limpid fluid under the pia mater and dipping down between the convolutions. It was about two lines deep at the posterior part of the vertex, the body lying on its back. The veins going to

* *Archiv für Psychiatrie*, Band viii, Heft 2. He seems to have been a man of average intelligence and led a good and respectable life.

the sinus were seen passing through the layer of fluid. The surface of the large, finely-convoluted brain with its pellucid covering, was beautifully shown by a ray of sunshine which fell upon the head of the dead boy. The radiating gyri of the island of Reil were not to be discerned on the right side; on the left, lines of division had been formed. On the right hemisphere the fissure of Rolando ran into the longitudinal fissure (a variety not very rare), and the parallel fissure (sulcus temporalis superior) was unusually long and deep. The brain was finely convoluted, especially in the frontal lobe, which was large. The gyri of the left hemisphere were not so carefully examined, as it was cut to pieces for microscopic examination. Selected portions were sent to Dr J. Batty Tuke. This distinguished pathologist could find 'no trace of heterogenous disease, simply a general coarseness of constituents; the fibres,' he writes, 'are distinctly coarse, and the cells are granular and not well formed; they are so granular that the most active cleaning agents employed for a long time do not serve to demonstrate either nucleus or nucleolus; they seem normal as to number and distribution; nuclei of neuroglia small, but in ordinary number; the vessels are not thickened as to their walls, but they have a tendency to varicosity.'

In many cases the appearance of the brain to the naked eye is insufficient to account for the mental want, and a finer examination is desirable. Mierzejewski, one of the first to make sustained microscopical researches in idiocy, has observed * that a brain which in the external arrangement of its convolutions presented the fœtal type, had its nervous elements as well formed as in brains completely organised. 'In this case the morphological arrest of the convolutions was accompanied by a perfect development of their histological elements, and the external form was not in accordance with

* *Journal of Mental Science*, January 1879.

the delicate structure of the tissue. Here there was not, consequently, a true arrest of development (morphologic and histologic), but a deviation from the type of normal development.'

'Up to the present time,' goes on the Professor, 'I have not met with a single description of the brain of an idiot in which the morphological arrangement of the convolutions and the microscopic structure of their nervous elements presented the embryo form. The case observed by Harck, and that by myself, are perhaps the only exceptions in this respect. We must regard these exceptions, moreover, with some reserve.'

The researches of Dr M. Jastrowitz * seem to throw light upon the minute structure of the brain which entails idiocy. In the fœtus he found that instead of the white substance of Schwann which surrounds the axis-cylinder in the adult, the tissues are embedded in the molecular substance which abounds in the white matter of the hemispheres, and, indeed, makes up the most of its composition. Axes-cylinders are found at an early period of fœtal life, lying naked in the white matter of the brain, and the molecular substance becomes less and less frequent, and at last disappears as the development of the white substance of Schwann goes on in the growing child—and this change of molecular stroma into the white substance of Schwann can be followed to a certain degree.

Jastrowitz finds the nerve-cells with all their characteristic marks fully formed at birth. He considers that the appearance of the fatty granular cells in the embryo is connected with the formation of nervous tissue, as these cells are observed to be present during the regeneration of a severed nerve.

Dr Jastrowitz regards the presence of these granular cells

* See 'Studien über die Encephalitis und Myelitis des ersten Kindesalters,' in the *Archiv für Psychiatrie und Nervenkrankheiten*, Band iii, Heft 1. Berlin, 1871.

in the spinal cord of new-born children, as well as infants at a later age, as a proof of morbid action. The general diffusion of these cells in the white substance of the brain of the six months' child, and their partial appearance in the child of nine months old, is also regarded as a sign of disease; for though these cells might have had a normal existence in earlier periods of the life of the embryo, their persistence is incompatible with the proper exercise of the functions of the developed organs.

Dr Jastrowitz had an opportunity of examining the body of the infant of an imbecile woman, who had a pretty large but unsymmetrical head. As the mother had a narrow pelvis from rickets, premature labour was induced, but the child died in a few days. The thorax of the infant was deformed with rickets. The vessels of the brain were much injected, and there were heaps of granular cells in all the lobes. Occasionally inflammation has taken place before birth, which sometimes extends from the brain to the spinal cord.

Later observers have found an arrest in the histological elements of the brain in idiots. Bevan Lewis * mentions the globose cell with a single delicate apex process with a perfectly uniform rounded contour, which is met with in man only in forms of developmental arrest in idiocy and imbecility.

In studying the brain of an idiot boy aged twelve, Dr Ford Robertson found a broad band in the cortex running through the frontal parietal and occipital lobes about the level of the large pyramidal nerve cells. This was evidently a layer in which the development had been arrested at an early stage. In some parts of this brain the nerve cells of the layer have attained the full-time fœtus stage; in others the nerve cells are quite absent.

After observing the normal structure of the brain, Dr

* *Text-Book of Mental Diseases*, p. 70.

Carl Hammarberg * made a laborious examination of the brains of nine idiots and imbeciles. He found the mental deficiencies to correspond with a scarcity of cells capable of normal function in the cortex, and that this scarcity of pyramidal cell is owing either to the brain tissues being arrested in the stage it reaches in the fœtus or in early infancy, so that few new cells reach their higher development. In some cases examined it appeared that only a part of the brain had been arrested in its normal development; the growth of the rest seemed in some way injured functionally, or there was a proliferation of new cells which are not capable of discharging a complete function. If only a small portion of the brain be arrested in growth, and the remaining portions take their normal development, though having fewer cells than usual, the mental deficiency is less marked,—the individual is not idiotic, but weak-minded. In one case, at least, he found that the cells after attaining their normal growth had degenerated.

Betz, Köster, and other observers have stated they found in the brains of idiots that the pyramidal cells were arranged in an irregular manner, and that their processes often took unusual directions. Dr Hammarberg treats this as an error of observation. It is, he writes, not unusual to find pyramidal cells in the normal cortex presenting their largest diameter horizontally to the cortex, while the apex processes have to wheel round to approach the surface. He observes that in none of the idiots' brains which he examined was the so-called disorder of cells more notable than what he found in brains of persons of normal intellect. Nothing is more striking than the exact relation which Dr Hammarberg makes out between the number of the pyramidal and spindle

* *Studien über Klinik und Pathologie der Idiotie nebst Untersuchungen über die normale Anatomie der Hirnrinde*, von Dr Carl Hammarberg; *nach dem Tode des Verfassers aus dem Schwedischen übersetzt*, von Walter Berger; und herausgeben von Prof. Dr S. E. Henschen, Upsala, 1895.

cells and the mental deficiency; where the cells are wanting, or very few, the idiocy is profound; where there are more cells there is more intellect. He seldom notes any alteration in the nerve fibres or in the vessels of the brain.

Dr Hammarberg's investigations were unfortunately cut short by an untimely death. The number of brains examined by him is not large, and the clinical history of some of his cases could not be well ascertained. Some were undoubtedly instances of genetous idiocy; others were affected with eclampsia or epilepsy. Were his researches accepted without any hesitation, they would be a strong confirmation of the common assumption that the larger nerve cells have a preponderating rôle in mental processes. So many other observers have recorded similar results, that Bernardini,* after reading the cases of idiocy recorded in medical literature, has come to the conclusion that the diminution in the number of the nerve cells in idiocy, and the changes in the form and number of their prolongations, ought to be ranked as now sufficiently proved. Bourneville in one case found the larger pyramidal cells swollen and hyaline with granular nuclei. Sometimes the nerve cells are infiltrated with granular pigment or calcareous matter. Vacuolation of the nuclei has also been observed. Microscopists have also described a proliferation in the cells of the neuroglia, and an increase in the number of spheroidal and ovoid cells; amyloid degeneration has also been observed. Alteration in the coats of the vessels has been noticed, and sometimes the vessels have been found obliterated.

The most attention has been expended upon the nerve cells; the fibres have been neglected. Dr Otto Klinke,† using Exner's and Weigert's staining methods, examined the distribution of the tangential fibres of the cortex in the brains of

* *Archivio Italiano per le Malatie Nervose*, Fasc. i, and ii, 1888.

† *Archiv für Psychiatrie*, Band xxv, p. 450.

seven cases of idiocy and five cases of insanity. He found the number of such fibres much diminished in idiocy, and also in senile dementia. The lower forms were most affected. The most marked diminution was found in the brain of an imbecile who died of general paralysis.

It must be borne in mind that such lesions are not found in all cases of genetous idiocy. In some, where a careful scrutiny has been made by competent observers with every means of examination, the changes found have been very slight, or none at all could be detected. During the last few years the resources of microscopy have been much augmented by new methods of cutting and dyeing the tissues, so it is likely that with such aids fewer of the changes in idiocy will be beyond our ken.

One might fairly suppose that the spinal cord should not escape being affected in genetous idiocy. I examined the tendon reflex in a hundred young idiots and imbeciles. In the epileptics the reaction seemed most lively. In three cases I failed to bring it out, but one of these had tabes. In four cases the reflex was dull and difficult to bring out. In six cases I failed to bring out the reaction on the left knee, though I succeeded on the right. In autopsies the spinal cord is rarely examined, owing to the difficulty and delay in getting at it. The best observations known to me are those of Dr R. S. Stewart,* who has recorded his study of the brain and spinal cord, in one case of simple genetous imbecility, in three others complicated with epilepsy, and one of hydrocephalic idiocy. He found in every case degenerative lesions of the cord corresponding with those of the brain. Where the brain was wasted and weighed less than usual there were diminished size and weight of the cord. In the brain he noted absence of well-formed nerve cells, especially of the larger

* University of Glasgow. Thesis for the Degree of M.D.: *Observations on the Spinal Cord of the Insane*, by R. S. Stewart, M.B., C.M., 1886.

pyramidal type, the smaller ones badly defined, with increase of the neuroglia. At the same time there were degeneration and atrophy of the large and smaller nerve cells of the cord, especially of those of the cornua.

Such results are not always obtained. Dr Otto * examined the cerebro-spinal axes in two cases of profound idiocy, and while he found in the brain microgyry and deficient development of the nerve cells, the spinal cords presented nothing abnormal, though the medulla oblongata was poorly developed.

Deficient Blood-supply to the Brain.

In post-mortem examinations of genetous idiots I have generally found the heart to be small and weak, the valves often incomplete, or the foramen ovale only partially closed. The pulse is generally feeble and the circulation languid, hence it may be guessed that the mental torpor is owing to a deficient blood-supply to the brain, especially in the cases in which to all appearances no fault can be found with the structure of the nervous centres. It is amazing how persistently neurologists overlook the prime importance of a supply of warm arterial blood to the functions of the brain.† We know

* *Archiv für Psychiatrie*, Band xxiii, p. 160.

† The significance of the smallness of the heart in idiots was pointed out by me in *Idiocy and Imbecility* (pp. 44 and 72). See also Dr Hagen in the *Psychiatrisches Centralblatt*, November 21, 1872.

Dr Wulff of Langenhagen (*Allgemeine Zeitschrift für Psychiatrie*, Band li, Heft 2) has made an important contribution to the subject in showing this comparative smallness of the heart in a precise and scientific form. He observed this condition in 123 cases which he examined. Dr Wulff's paper is illustrated by diagrams and tables which bring out the general truth that the heart in imbeciles is smaller in proportion to the weight and height of the body than in insane persons.

He observes that the smallness and weakness of the heart in idiots is general, and not the result of atrophy or degeneration following disease. With idiots the brain is also, in proportion to the weight and height, smaller than in sane people, but the diminution of the heart does not go parallel with the diminution of the brain. The diminished size of the heart is greater in proportion than the

what a large volume of the circulating fluid actually is sent to that organ, and not solely for the purposes of nutrition or repair of waste. In fact, when repair is most actively going on, as during sleep, the supply of blood is diminished. We know that when the circulation of blood is lessened, even by pressure on the carotids, that mental manifestations are suspended. Thus the functions of the brain are dependent upon a certain interaction between the blood and the solid tissues. A confirmation of this view has been given by the remarkable results of the administration of the thyroid juice of animals in one form of idiocy in which the thyroid gland is wanting. It has been observed that in a few days the mental torpor began to disappear simply after the supply of a small quantity of this juice to the blood. It is to be kept in mind that in several cases in which a careful examination was made, pathologists have failed to find anything abnormal in the brains of these sporadic cretins.

Other malformations are revealed by dissection,* abnormal distribution of the bloodvessels, unusual arrangement of the muscles, lobulated form of the kidneys. If a lengthened dissection could be made of the whole body, it is likely a great many interesting peculiarities would be discovered in idiots.

Treatment.

The treatment of genetous idiocy is mainly mental, moral, and educational, as will be explained hereafter. The children

diminished size of brain, hence Wulff supposes that in some cases, although the blood-supply may be sufficient to afford nourishment to the brain so as to enable it to grow to a certain size, the heart does not send enough for the development of the finer nerve elements, or for the excitement and maintenance of normal mental activity.

* Mr E. Carver, Demonstrator of Anatomy in the Cambridge University, who dissected the body of an idiot, found many irregularities in the origin and communications of the arteries in all parts of the body. Abnormalities were also observed in connection with the palmaris longus, lumbricales, and extensor muscles of the thumb. Some idiosyncrasies were also noticed in the skull. See *Journal of Anatomy and Physiology*, May 1869.

should sleep in well-ventilated rooms, and a moderate temperature be maintained during the night. The system should be invigorated by regular exercise, gymnastics, judicious diet, and other hygienic measures. The scrofulous diathesis should be treated in the usual manner. Where the circulation is feeble, and the extremities habitually cold, I have sometimes increased the quantity of flesh meat, and given coffee twice a day. In general, milk, not meat, should be a main article of the dietary. Great care is required to prevent such children taking chilblains, and preventing them going into ulcers when they do appear. Bathing the feet every night during winter in a solution of alum has a preventive effect. A coating of collodion upon the toes is also said to answer. To get slow ulcers to heal, I have several times been obliged to raise the temperature of the foot night after night continuously by artificial heat. The gums should be kept free from carious stumps, and astringent applications, such as alum and kino, used in cleaning them. Genetous idiots from the towns, where they are apt to suffer from confinement, generally improve more than those from the country, with whom the tone of health is stronger.

CHAPTER VI.

MICROCEPHALIC IDIOCY.

Nature and Symptoms.

THE relation of the size of the brain to mental power is a puzzling question in physiology. The phrenologists used to say, size, other things being equal, is a measure of power, but unhappily other things never were equal. Even taken with this perplexing though necessary qualification, the proposition could not be proved. An ant, for example, has wonderful perceptions, instincts, social tendencies, affections, and mental powers, different indeed from human intelligence, but still belonging to the class of psychical faculties, and all this, as Darwin has remarked, with ganglia not so large as the quarter of a small pin's head. Suppose this molecule of neurine to weigh 50 oz., would its capabilities be increased proportionally? What a terribly energetic and strangely instinctive and intelligent animal we should have. But it is clear that the intelligence of an animal, even of the same order, does not increase with the rate and volume of the brain, for in that case the elephant, whose brain weighs between eight and ten pounds, ought to be three times as clever as man. Physiologists then said that we must take into consideration the proportion of the brain to the size of the body. This, however, again failed, for a monkey, a weasel, and many birds, would have more intelligence than man, as their brains bear a higher ratio to the weight of the body; and, indeed, the proportion of the weight of the brain to the body is in childhood sometimes six times as great as in the adult. Nor can one see how his

intelligence would be diminished if his body were twenty times larger than it is, unless certain portions of the cerebrum are devoted to the management of the motions or organic functions of the frame—and this seems to be the case ; but until we can separate those parts concerned with the psychic force, and those parts whose function it is to incite or regulate muscular motion or trophic changes, we are much in the condition of a man who would try to weigh a nugget of uncertain mineral composition in order to determine the amount of gold it contains. Even if we lay aside all comparison of different species of animals, and take man alone, no one ever affirmed that the possessor of the heaviest brain must have the greatest intelligence, or that the slippery force of thought, the *vivida vis animæ*, can be measured by the balance. In a paper on the weight of the brain in insanity, we are told that the brain of an imbecile aged 75 weighed 63 oz. 4 drachms, that is, heavier than Dr Abercrombie's,* and in a genetous imbecile who died in the Hants County Asylum the brain weighed 70½ oz. The brain of a man aged 43, with epilepsy of 7 years' duration, weighed 67 oz. The circumference of the head was as much as 25⅝ inches =65 centimetres. He had been very intelligent. (*Lancet*, July 20, 1895).

We have reasons for thinking that in the heavy brains recorded in the Asylum Reports, the weight of the normal nerve tissues is increased by adventitious deposits. The weight of the two hemispheres is frequently unequal, especially in epileptic insanity and in general paralysis. The heaviest brain on record is that of Turgenieff, the Russian novelist, which weighed 71 oz.—*i.e.*, 18 oz. heavier than Napoleon's brain (53 oz.), and no less than 30 oz. heavier than Gambetta's (40·9 oz.). It is often stated in books that

* *Edinburgh Medical Journal*, March 1872.

Cuvier's brain weighed 64 oz.; in reality it weighed no more than 58·3 oz.*

Dr Ffister mentions a Berliner named Rustan whose brain weighed 2222 grammes = 78 oz., and that of a mulatto 45 years old which weighed 1830 grammes = 64½ oz.; but it is doubtful whether either of these brains were healthy. According to Krause, Rustan's brain, judging from the cranial capacity, should not have weighed more than 1885 grammes. It is, however, certain that some very heavy brains have been noticed which belonged to persons not distinguished for superior mental capacity. If, to gain a wider field for generalisation, we leave individuals for races, we still meet with the most perplexing anomalies. We cannot affirm that the races which have shown most intellectual force have ever had the largest heads, unless we are prepared to say that the negro is mentally superior to the Hindu, or that the old Peruvians are to rank no higher than the Hottentots and the savages of Australia.

Dr Daniel Wilson † tells us that 'the Peruvian's head unquestionably ranks amongst the microcephalous races.'

There is no doubt that the Peruvians, as a people, had carried metallurgy to as high a development as has been attained by any race ignorant of working in iron. They had acquired great skill in the arts of the goldsmith, the engraver, chaser, and modeller. Pottery was fashioned into many artistic and fanciful forms, showing ingenuity and great versatility of fancy. They excelled as engineers, architects, sculptors, weavers, and agriculturists. Their public works display great skill, combined with comprehensive aims of practical utility; and alone, among all the nations of the new world, they had domesticated animals, and trained them as

* *London Medical Gazette*, June 9, 1832, quoted by Dr Joseph Simms, a well-known lecturer on Physiognomy in the United States.

† *Brain-weight and Size in Relation to Relative Capacity of Races*, by Daniel Wilson, LL.D, etc., Toronto, 1876, p. 47.

beasts of burden. It is not, therefore, without reason that Dr Morton adds: 'When we consider the institutions of the old Peruvians, their comparatively advanced civilisation, their tombs and temples, mountain roads, and monolithic gateways, together with their knowledge of certain ornamental arts, it is surprising to find that they possessed a brain no larger than the Hottentot and New Hollander, and far below that of the barbarous hordes of their own race. For on measuring 155 crania, nearly all derived from the sepulchres just mentioned, they gave but 75 cubic inches (equivalent, after due deduction for membranes and fluids, to a brain of 40·1 oz. avor. in weight) for the average bulk of the brain. Of the whole number, only one attains the capacity of 101 cubic inches, and the minimum sinks to 58, the smallest in the whole series of 641 measured crania. It is important further to remark, that the sexes are nearly equally represented, viz., 80 men and 75 women.' What is quite as singular as the small size, almost all these Peruvian crania were artificially deformed, a circumstance which will be considered when we come to traumatic idiocy.

Some hold that it is in the fineness and degree of complexity of the convolutions, or in their symmetry on each hemisphere, that the power of thought depends; others say that we must look to the extent of surface and the complexity of the convolutions and their connections; others to the total amount of grey matter separated from the large mass of white matter of the brain. Moreover, the brain is but one factor. The quality of the blood which circulates through every part of the nervous tissue, the quickness of the circulation, the method of distribution of the vessels, and the assimilative power existing between the nourishing fluid and the nervous matter, all these go to make the sum mount, and a deficiency in any of them may cause the harmony to jar.

It will be presently seen that the study of microcephaly throws light upon this somewhat obscure field of inquiry.

The average size of the heads of idiots, excluding those of hydrocephalic ones, is somewhat smaller than the average size of healthy people; but to this rule there are many exceptions. Some have heads larger than the average size of sane individuals of the same age; and I have measured heads of people of normal intelligence, which are smaller than any under my care, with a few exceptions. Moreover, those idiots who have larger heads do not surpass in intelligence those who have smaller ones. Save in the cases of hydrocephalic and microcephalic idiots, the size of the head gives no estimate of the comparative intelligence of the children.

It is, however, agreed that there is a certain minimum size of head, below which the possessor is necessarily an idiot. Felix Voisin says that the proper exercise of the intellectual faculties is impossible with a head of from 11 to 13 inches in circumference, and a measurement of 8 to 9 inches from the root of the nose to the posterior border of the occipital bone. To this rule there has never been an exception. He thinks that heads from 14 inches to 17 inches in circumference, and from 11 to 12 inches for the arc comprised between the root of the nose and the foramen magnum, are too small for ordinary intelligence; but heads of from 18 to 18½ inches in circumference, though small heads, allow of the regular exercise of the intellectual faculties.

I think we may therefore assume that below 17 inches in circumference the manifestations of intellectual power would be feeble. But heads of this small scale are rare even amongst idiots, for idiocy is generally the result of disease, not of smallness of the brain.

I should, therefore, be inclined to give the name of microcephalic to all heads below 17 inches = 431 millimetres in circumference; but on a point like this it is difficult to bring observers to one rule. Broca calls microcephalic every cranium which has not been artificially deformed, and whose

antero-posterior diameter is less that 148 millimetres = 5 inches 9 lines; to heads larger than this, but still of small size, he gives the awkward term of demi-microcephalic, without fixing the limit of normal cranial capacity; but he gives below 1049 grammes for males and 907 grammes for females as the limit of weight. Topinard gives a horizontal circumference of 349 millimetres = 13 inches 7 lines to the microcephale, and to the semi-microcephale of as much as from 432 = 17 inches to 480 millimetres = 18 inches 10 lines.

It may be well to hold in mind that the average brain weight in man ranges from 40 to 52½ oz. = from 1133 to 1436 grammes, and in women from 35 to 37½ oz. = from 992 to 1341 grammes. Ffister gives the average weight in German brains as 1375 for men and 1245 for women, and observes that the brains which weigh from 150 to 300 grammes less than these standards generally belong to weak-minded persons. Giacomini states the limits of oscillation apparently in both sexes as from 1000 to 1500 grammes, and this is easily remembered. The capacity of a brain weighing 50½ ounces is 1502 c. c. = 91 cubic inches. Man differs from other animals, not only by the greater size of his brain, but by its great increase in size after birth. According to Meckel the weight of the brain in the new-born child is 300 grammes, but it doubles in five months.

We see that in man the mental capacity diminishes with the brain weight if we use large weights; but if we use smaller weights, two or three ounces, for example, we soon find that we cannot establish constant relation between the size of the hemisphere and the amount of mental power shown.

Few microcephales are of ordinary stature, and many of them are mere dwarfs. In the accounts published the psychical manifestations are often passed over in a very superficial way, while there are long descriptions, not easy to

follow, of convolutions and lobes whose functions have not yet been determined. In general we have more measurements than would be required for a mantua-maker, boot-maker, stay-maker, spectacle-maker, and truss-maker, all at once, while the mental characteristics are passed over in loose terms, though the interest consists in knowing what mental power he possesses with his fraction of brain.

There are instances of two, three, and even four microcephales being born one after the other to the same parents, and there is one case of microcephalic twins. Nevertheless it is the rarest of all kinds of idiocy; but, owing to the speculations of Darwin, microcephales have been more carefully studied than other idiots who have heads of normal size. If we may judge from the cases published, there are nearly twice as many male microcephales as female.

Microcephaly may be either general or partial. Certain portions of the encephalon may be abnormally small or altogether wanting; but in general the deficiency consists in the smallness of the hemispheres. The head is narrow and tapering towards the top—oxycephalic, as some call it. On this account the internal capacity of the cranium is smaller than what might be thought from the circumference. The nerves of special sense are generally well developed, and the ganglia of the base of the skull and the spinal cord are much nearer the normal size than the hemispheres. The cerebellum also is relatively larger than in the normal brain. In the case of a microcephalic idiot in the Asylum at Bareilly, the cerebellum was one-half of the weight of the cerebrum,* the ordinary relation being one to eight. In some microcephales

* Dr J. H. Lock, the superintendent, says of this case :—'He was unable to articulate, walked very weakly, with a half-running gait, and could only be made to understand about his wants for food and clothing.' . . . His height was 4 feet 8 inches; and the weight of his brain—cerebrum, 6½ oz.; cerebellum, 3½ oz.; pons and medulla oblongata, ½ oz.—General Report, No 4, on Lunatic Asylums for the year 1871, Calcutta, 1873, p. 25.

the mental manifestations are very slight. In the Infirmary Ward of the Metropolitan Asylum at Darenth there is generally about a dozen of poor little creatures with small heads who have never walked, never spoken, can execute no voluntary movement, save perhaps turning the eyes to watch the spoon that feeds them, living an almost vegetable life, yet with warm blood and an organism in most parts the same as our own.

Varieties.

In many of these cases no doubt the brain is diseased. In some instances this has been actually proved by the necroscopy. Dr James Murray Lindsay had under his care at Hanwell a female idiot who died in the seventeenth year of her age. The limbs, chest, and spine were misshapen with rickets, but she was able to walk. She was stunted in growth, and of a childish appearance. She was unable to say a single intelligible word, but chirped like a bird. She seemed to pay no attention to sounds save the jingling of keys and the playing of musical instruments. The heart weighed $2\frac{1}{4}$ oz., with a valvular opening near the foramen ovale. The brain weighed no more than 13 oz. The convolutions were shallow and few in number. The cerebrum, wanting in development posteriorly, did not overlap the cerebellum. The brain substance was softened and watery throughout. The ventricles were dilated with serum. The choroid plexuses were œdematous.

Dr Stark * described a woman whose cranial capacity was 785 c. c., less than that of a child of one year old, which is 850 c. c. She could speak and do easy work. Besides lesions in the spinal cord, he found traces of chronic encephalitis with amyloid degeneration.

* *Zeitschrift für Psychiatrie*, Band xxxi, Heft 5, 1874.

Giacomini divides microcephaly into true and false. The latter variety is complicated with morbid processes. The true microcephaly he regards as mainly a morphological deficiency, but microscopical studies of the brain tissues are still much needed.

Beach examined the brain of a microcephalic girl of six years which weighed 20½ oz. = 581 grammes (circumference of head 397 millimetres).

Only five layers could be found in the frontal lobes. The nerve cells were rounded, sometimes pear-shaped, with round or oval nuclei ; only a few cells had processes, and these were small and stunted. Steinlechner found the nerve cells in the two microcephalic brains less in quantity ; the same scarcity of large cells was found in the shortened spinal cord.

Cases of microcephaly complicated with encephalitis or hydrocephalus have the same relation to cases of genetous idiocy as the microcephale in whom the brain tissues are healthy bears to ordinary human beings. The one has a small diseased brain, the other a small healthy brain. In microcephales the palate is generally flat. In some instances it has been noted to be vaulted, but I do not know whether this would help us to distinguish these two perplexing subdivisions.

Atavism.

Vogt * believes microcephaly to be a case of atavism, the appearance of a type of brain inherited from some very remote ancestral ape. As an illustration, he gives the occasional appearance of the two supplemental toes in the horse, which, he thinks, indicates its descent from the hipparion, an animal of the Pleiocene period, with two shorter toes on each

* *Mémoires sur les Microcéphales ou Hommes Singes*, par Charles Vogt, Geneva, 1867.

side of the hoof—which has since then been so often trotted out in the Darwinian arena. In the same way, the brain of the microcephalic idiot is the result of arrested development of a human brain checked in its evolution at the simian stage.

The observations of Gratiolet are against this theory. 'The study of the brain of microcephales,' he writes,* 'has furnished me with other reasons for proving through anatomy the absolute distinction of man. On comparing attentively the brain of apes with that of men, I found the arrangement of the central convolutions to be in adult age the same in both groups. If one went no farther, there would not be sufficient grounds to separate man from animals in general, but the study of development gives us a real distinction. The temporo-sphenoidal convolutions appear first in the brain of the ape, and the frontal lobe last; but exactly the opposite takes place with man—the frontal convolutions appear first, the temporo-sphenoidal last. Thus the same series is repeated in the one case from Alpha to Omega, in the other from Omega to Alpha.

'From this fact, which was rigorously verified, there flows a necessary inference: no arrest of development can make the human brain more nearly resembling that of the ape's than it is in the adult; far from that, it will differ so much the more, the less developed it is. This inference is completely justified by the view of the microcephalic brain. At first it might be taken for the brain of some new and unknown ape; but the slightest attention is enough to save one from this error. In the ape the parallel fissure is long and deep, and the sphenoidal lobe is marked by complicated furrows. In the microcephale, on the other hand, the parallel fissure is

* 'Mémoire sur la Microcéphalie considérée dans les Rapports avec la Question des Caractères du Genre Humain,' par le Docteur Pierre Gratiolet, *Journal de la Physiologie de l'Homme et les Animaux*, Paris, 1860, p. 110.

always incomplete, and sometimes wanting, and the sphenoidal lobe is almost entirely smooth. That is not all: in the microcephale the second bridging convolution, between the parietal and occipital lobes, is always superficial, a character peculiar to man.* In the Pithecæ, on the contrary, the convolution is constantly hid under the operculum of the occipital lobe. Thus, in the depth of their degradation, the brain of the microcephale presents human characters often less voluminous and less convoluted than those of the ourang or chimpanzee; they do not become similar. The microcephale, however low he may be, is not a beast, but a diminished man.

'I have examined the question, Does microcephaly precede birth? Of this there can be no doubt. In one of the cases of microcephaly which I have studied, the general form of the brain and of the fissure of Sylvius showed that the monstrosity was at least contemporary with the fifth month. It is probable that this state depends upon some cause: early under the influence of some primordial generative weakness forms are produced which differ from all normal states. Moreover, in the new-born child, in its normal condition, the arrangement of the cerebral convolutions is complete in all its parts. If microcephaly were after birth, these convolutions would remain, and the volume of the brain alone would be diminished; but it is not so; the growth has languished from the beginning, its fold is shortened, and has stopped growing too soon.'

Gratiolet remarks that those microcephales in whom the convolutions are so little complicated are all dwarfs.

* Sir William Turner has shown that the views of Gratiolet on this point are not always in accordance with facts. See his 'Notes on the Bridging Convolutions in the Brain of the Chimpanzee,' from the *Proceedings of the Royal Society of Edinburgh*, 1865-66. Turner's observations were confirmed by observations made by Rolleston, Marshall, and Broca; see 'L'Ordre des Primates par Paul Broca': *Bulletins de la Société d'Anthropologie de Paris*, tome quatrième, 1869, p. 389.

In the microcephales the impressions of the senses are lively. They are fond of moving about, but have little power of continuous attention. Their restless motions recall those of the butterfly. Though they are late in learning to walk, in general they have the free use of their limbs, which Gratiolet accounts for by the comparatively large development of the cerebellum.

If the brain be healthy, the prognosis is better than that of many cases where the brain, though of normal size, is the seat of chronic disease.

Vogt and other disciples of Darwin see in the mental characteristics of the microcephalic idiot something resembling those of the anthropoid ape. It seems to me that the intelligence of a monkey is very different from that of an idiot. You cannot reach the simian intellect merely by deducting so much from the human. It is different in kind as well as in degree. One might as well expect to find the same character of intelligence in an infant of two months old and in a full-grown chimpanzee, because the cranial contents were about the same. The mental powers which the monkey possesses are in perfect accordance with his organism. His agility in climbing and swinging himself from branch to branch is something marvellous. I have seen whole flocks of monkeys running down a wooded hillside with the greatest rapidity, without ever touching the ground, leaping from one branch to another, sometimes laying hold with the superior, sometimes with the inferior extremities, never tumbling, and scarcely ever missing their aim. This demands some kind of mental as well as physical powers, and cannot be clouded over by the vague word instinct. Monkeys are extremely alert, watchful and nimble ; very careful against wild animals ; they do not lie down to sleep, but sit upon trees all night; their slumbers are very light; they are attached to and careful of their young. On the contrary, microcephalic idiots,

though in general more lively than those of other classes, have no fondness for climbing, and are as destitute of animal instincts as they are of human intelligence. They have no powers either of feeding or protecting themselves from danger, and if left to themselves would soon perish. They present the effaced lineaments of a human being, which only a wandering fancy will mistake for those of an ape. What qualities they have are of a human character. They laugh at what amuses them; they have human sympathies and human affections. Where they learn a few words, they use them as human beings do to signify things. The resemblance between microcephales and apes seems to me to rest especially upon the negative quality of stupidity. The sexual manifestations of microcephales are feeble; there is no record of a microcephalic woman bearing a living child, and even if she did so, she could not bring it up.*

It happens now and then that a microcephale has habits which remind one of some of the lower animals. Thus Lombroso describes a foundling, called Battista, $3\frac{1}{2}$ years old, with a head of about 14 inches in circumference, who was restless, strong, and active, and extremely fond of leaping. He leapt with the spine bent, and the hands before him, like an ape, and went by the name of the Monkey (il Scimmiin).

* Giacomini's observations agree with the statement of Vogt, which he quotes: 'Les organes génitaux se développent aussi lentement, il est vrai, mais suffisament à la fin. Les femmes sont menstruées; mais la menstruation arrive tard. Quelques faits paraissent prouver que les appétits sexuels existent aussi chez les hommes arrivés à un certain âge. Malheureusement nous ne connaissons aucun examen plus approfondi, aidé du microscope, des organes sexuels mâles, mais quant aux femmes, il est certain qu'elles auraient été capables d'avoir de la progéniture.' 'E la conferma di ciò la troviamo nella struttura dell' ovaia della manolino, che si è presentata normale, e nella microcefala di Short, d'anni 25, la quale concepì, ma il feto nacque morto. Questa credo que sia la sola microcefala che abbia soddisfatto alle funzione della riproduzione.'—*Una microcefala osservazioni anatomiche ed Antropologiche*, del Dottore Carlo Giacomini, Torino, 1876, p. 79.

A later work by Professor Giacomini is the most complete treatise on the subject. It is entitled *I Cervelli dei Microcefali*, Torino, 1890, p. 331.

Yet we often see children that are fond of leaping and given to imitation, without supposing that they could only have inherited such tastes from an ape which has been dead millions of years ago, if it ever existed at all.

But what are we to make of the microcephale who was called the Bird-man (l'uomo uccello), from his imitation of the habits of a bird ; or another called the Rabbit-man (l'uomo coniglio), from the habit of moving the nose and lip, and from being timid and fond of lettuce and cabbage? When he was frightened he used to stamp with his feet, as rabbits do. Lombroso also mentions a small-headed idiot, who resembled a goose in many things, and had the cutis anserina ; another butted with his head and cried be, be ; but even the most advanced Darwinians do not claim to be descended from geese or rabbits or sheep.

If the Darwinians fall in with a foal with two side toes, they cry out, here is a proof of the descent of the horse from the hipparion ; and when we show them a child with six fingers, why should they not view this as a proof of man's descent from a six-fingered ape?

Dr Aeby * of Berne, who has with patient labour examined and measured every part of the frame of the microcephale, and compared it with that of the ape, Dr Bischoff of Munich, whose dissection of the body of a microcephale, hereafter described, and Mr John Marshall, have subjected Vogt's theory to a searching examination. If man, they argue, have a simian origin, it must have been from one of the lower monkeys ; certainly he is not descended from any of the existing anthropoid apes. The intermediate species, which

* See 'Beiträge zur Kenntniss der Mikrocephalie,' von Prof. Dr Chr. Aeby, in Berne *Archiv für Anthropologie*, Sechster und Siebenter Band, Brunswick, 1874-75 ; and a paper 'On the Brain of a Bushwoman ; and on the Brains of two Idiots of European Descent,' by John Marshall, F.R.S., etc., in the *Philosophical Transactions of the Royal Society of London* for 1864.

must have been numerous, have disappeared. But if we have in the microcephale a reproduction of the brain of this 'Uraff,' why cannot we bring the brains of microcephales to one common type? Why do they not resemble one another, as the foot of the horse is said, in some rare cases, to resemble that of the hipparion? The truth is, microcephalic brains neither resemble one another nor the brains of any monkey, save in those common features in which the simian brain resembles the normal human one. As Dr Aeby observes, it is precisely in the most important points that there is the greatest difference between the brain of the microcephale and that of the ape. For example, in the microcephale, the hemispheres are frequently asymmetrical ; the corpus callosum is generally shortened, especially from the posterior end ; in one instance, recorded by Dr Cramer, the corpus callosum was entirely wanting, and the commissures deficient. The occipital lobes, too, are often arrested in growth, and the island of Reil left uncovered.

In the microcephalic brain we still see the human type with its folds and convolutions stopped in their growth, now here and now there struck by an arrest of development which we cannot clearly explain, but which is not a copy of the brain of any monkey that ever existed or indeed could have existed. The brains of microcephales have some characteristics peculiar to the human brain, 'just as the toes,' to use the illustration of Professor Owen, 'as soon as they appear in the human embryo, characterise the foot, whilst they bud forth in the ape in the direction to form the human hand.' Microcephaly comes into the domain of pathology, and occurs in the lower animals. Aeby has a preparation of a microcephalic calf, and as in the human microcephale, the relative size of the occipital bone to that of the frontal bone is increased.

Lombroso, who has evidently no speculative objection to the theory of Vogt, has signalised some anomalies which he

found in nine cases of microcephales, only four of whom, however, had very small heads.

The pithecoid appearances noticed in these creatures were, down scattered over the forehead and body, the size of the ears, the elongation of the limbs and of the phalanges, the curving of the back in one case, and the leaping character of the walk in another. On a previous occasion, Lombroso has noted a microcephale in whom the forearm was elongated; and another, Gambardella, whose body was covered with black and shining hairs. None of the anomalies noted recurred with any constancy in these microcephales. Moreover, some of the peculiarities had no resemblance to any characteristic either of the ape or the negro; for example, the absence of the testicles in two cases, and the want of the incisors in another.

Lombroso remarks that the assertion of Vogt that microcephales have a pithecoid skull on the crown, and human at the base and face, finds both contradictions and confirmations. 'It is true that our microcephales have a retreating forehead, and that the arch of the cranium is more or less flattened; it is true that the development of the angular process of the frontal bone, the atrophy of the orbital surface of the floor of the cranium, the ethmoid beak of the cerebral lobes, the incomplete development of the occipital bone, the position of the occipital foramen more forwards than usual, and the direction of the coronal suture in Case 1,—these are appearances truly pithecoid. On the other hand, not only have we in these, as in other cases of microcephaly, the absence of the median crest of the pitheci, but even the curved temporal bones, so well pronounced in the black races, are wanting.'

Dr Chr. Aeby gives, as the results of his most careful examinations and measurements, that in the trunk and limbs microcephales present no difference from what is normal in man.

Causes Discussed.

In many cases the superior sutures of the cranium are closed. In three heads of microcephales dissected by Gratiolet the sutures at the base of the skull were behind the usual stage of development, while those above were closed; the inverse condition is often met with in cretins.

Baillarger* saw a woman in the Valais who had five children, the first two well formed, the other three microcephalic. She said that the microcephales were born without the soft space which is found on the head of all new-born children. He afterwards saw another woman who made the same statement of a microcephalic child then aged two years. Baillarger subsequently examined the skull of a microcephalic child whose head was no more than 35 centimetres = 13 inches 9 lines in circumference. In this child all the sutures had closed in save the lambdoid. He also cited a case of Vrolik of Amsterdam, where all the sutures were united in a microcephale aged seven years. Dr John Thomson has observed that a very characteristic symptom in the infancy of microcephales is the abnormal early closure of the anterior fontanelle. Cruveilhier† mentions a child who lived eighteen months, in whom all the bones of the cranium were united without any sutures. The vertical diameter of the cranium in this child measured no more than an inch. It never gave, he adds, any sign of intelligence; its limbs were incessantly in motion; it expressed its wants by cries. Cruveilhier does not describe the appearance of the brain, which must have been so small.

So many cases have been collected of microcephales with open sutures, that no one‡ will continue to hold that the

* See *Gazette Médicale de Paris*, 2 Aout 1857, p. 482.

† *Anatomie Pathologique Générale*, Paris, 1876, tome troisième, p. 164.

‡ Vogt has misstated the views of Virchow when he says that the German pathologist holds that—'La microcéphalie doit être necessairement combinée avec les synostoses prédominantes de la voûte crânienne' (p. 88). In reply to this, it is enough to quote Virchow's own words:—'Dass es Fälle von Mikrocephalie ohne

small size of the brain is owing to the sutures closing in and thus hindering its growth. Even in those cases where the sutures have closed in before birth, the question still remains, whether the brain ceased to grow because the sutures are closed, or whether the sutures closed in because the brain ceased to grow? or, lastly, whether both the brain and its coverings ceased to grow under a common cause? It seems to me that if the sutures closed in and the brain continued to grow, the symptoms described as following hypertrophy of the brain would be produced, which, I think, is not the case. It probably is quite true that the principal increase in the capacity of the skull takes place at the sutures, as Virchow has pointed out; but there is no proof that this is the only method by which it can increase. The skull, like other bones, undoubtedly can grow by deposit on the one side and absorption on the other, just as the medullary canal is formed in the long bones or the neural arch widens in the vertebræ. The different pieces which enclose the spinal cord are certainly formed into one bone from the third to the fifth year at the farthest; but after this the cavity is increased by the simple process of absorption in the one side and deposition on the other. The skull does not limit the brain, nor does the brain extend or distend the skull, but both grow harmoniously together under the influence of a formative force inherent in the whole organism which suits the size of the skull to the size of the brain, as it moulds the limbs of either side to the same bulk and shape. It is possible that in disease this symmetrical working may be deranged; the brain may increase too rapidly for the skull, or the closure of one suture may compel

Synostoses der oberflächlichen Nähte gibt habe ich früher erwähnt.'—*Untersuchungen über die Entwickelung des Schädel-Grundes*, von Rudolf Virchow, Berlin, 1857, S. 80-105. Rokitansky, *Lehrbuch der Pathologischen Anatomie*, Zweiter Band, Wien, 1856, p. 433. Dr Westphal in 'Proceedings of Berliner Medicinisch-Psychologische Gesellschaft,' reported in *Archiv für Psychiatrie*, Band iv, Heft 1, Berlin, 1873, S. 261.

the brain to grow in another direction; but one is no more bound to believe that microcephaly is caused by early closure of the sutures, than that hydrocephalus or hypertrophy of the brain is caused by retarded ossification.

Giacomini believes that the other nerve centres, especially the spinal cord, are influenced by the cause which has produced microcephaly, and at the same period and in the same degree. Micromyely co-exists with microcephaly. This he has verified in at least three cases of true microcephaly. He farther thinks that the diminution in bulk of the spinal cord is partly primary and partly secondary, lying in the path of cerebral conduction following upon the poorer development of the cerebrum. Alexandra Steinlechner,* who made a careful examination of two spinal cords of microcephales, found that the diminution in bulk especially implicated the pyramids, the columns of Goll, the ganglia of the anterior horns, and to a lesser degree the direct lateral cerebellar tract. The size of the posterior root zone was not affected. The cerebellum is generally diminished absolutely but not relatively—that is, it bears a higher percentage to the cerebrum than in the normal encephalon, in which the relation stands at 85 to 13. In some cases of microcephaly the cerebellum is about one-fifth of the weight of the brain.

Hervouet† has recorded the case of a microcephale, aged three and a half years, without spasms or contractures, in whom there was a complete absence of the pyramidal tracts in the cord.

Dr Guibert,‡ after citing some cases in which the size of the eyes as well as that of the brain was diminished, observes these examples of microphthalmia amongst microcephales evidently show that the fœtus at a given epoch has been

* *Archiv für Psychiatrie*, Band xvii, Heft 3.

† *Archives de Physiologie*, tome iv, 1884.

‡ *La Vision chez les Idiots et les Imbeciles*, par le Dr Armand Guibert, Paris, 1891.

subjected to some vital trouble which has involved the eye and the brain at the same time; and whatever may be the simple arrangement of the cerebral convolutions, and whatever resemblance they may bear to the lower animals, it seems to us that the occurrence of a deficient size of the eye, which cannot be regressive at the same time as a deficient size of the brain, allows us to have doubts of the regressive evolution of the nervous centres. The same morbid cause, it appears, has reached both organs.

Illustrative Cases.

Freddy.—The following case attracted much attention from the striking smallness of the head. He was a healthy and well-made child, with good teeth and small hands and feet, but little for his age, which was eight years.

Fig. 2.
Microcephalic Idiot.

He was quarrelsome and unmanageable, biting and kicking when angry. If his nurse pretended to cry when he struck her, he would appear sorry. She thought him the

most intelligent child among eight idiots of about his own age. If the other children struck him he would fly at them. He was imitative, but inclined to steal; when caught stealing, he seemed ashamed and turned red.

A more careful description was given by Dr G. E. Shuttleworth, at the meeting of the British Medical Association in August 1875.

'Frederick —— is now eleven years of age, and has been under my observation in the Royal Albert Asylum during the last four years. He is a well-knit, straight-limbed boy, 46¾ inches high, weighing 47 lbs.; and, in spite of the peculiar conformation of his head, has a fairly intelligent expression, with large lustrous eyes. The following are his head measurements as given in Bucknill and Tuke, upon the authority of Dr Ireland's observation in 1871, and also as recently taken by myself:—

	1871.	1875.	Dif.
Circumference . . .	14⅛ in.	14½ in.	⅜ in.
From root of nose to spine of occiput (tape)	7⅞	8½	⅝
Ditto, calliper measure . . .		4 11/12	
From ear to ear over vertex (tape) . .	9⅞	10	⅛
Ditto, calliper measure . . .		3¾	
From ear to middle of forehead . .	4¼	4¼	
From ear to middle of occiput . .	4	4¼	¼

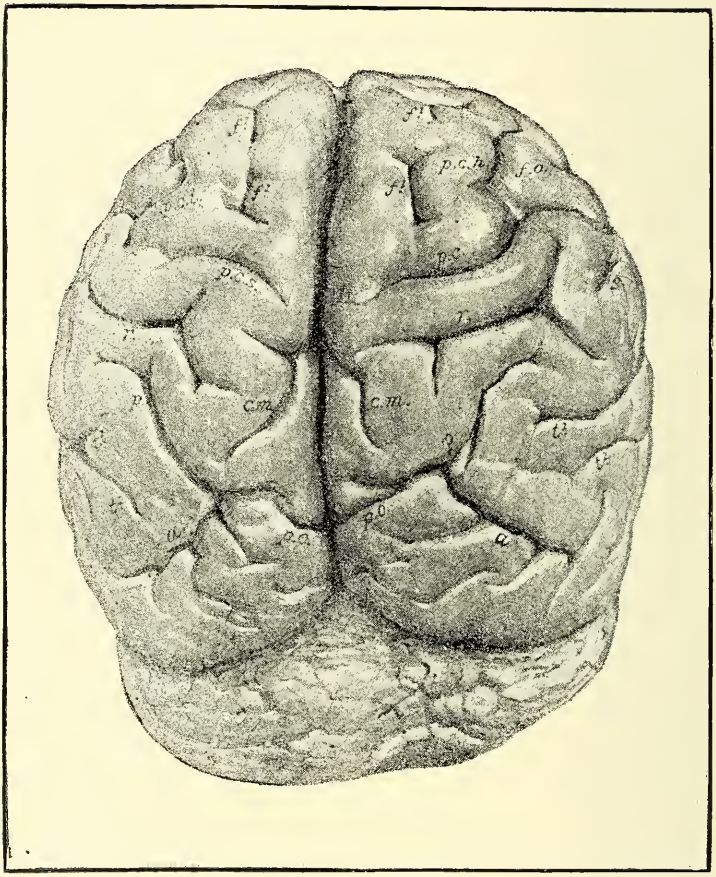
The two measurements, made, as I believe, by comparable methods, would seem to show that the increase in the size of the cranium during the last four years depends upon development in the occipital and parietal regions, rather than in the frontal. There is nothing distinctively pithecoid in the aspect or conformation of this boy's face or skull. Though his forehead recedes, there is no great flattening of the arch of the cranium; the skull is simply on a small scale. The profile, indeed, has somewhat of a bird-like aspect, and, it is remarked, bears strong resemblance to that of the so-called Aztec children exhibited in this country some twenty years ago.

His temper has much improved by his training in the Royal Albert Institution. As a result, no doubt, of discipline, he is now well conducted and fairly sociable. Though unable to articulate clearly more than a few monosyllabic words, such as 'look,' 'come,' 'see,' etc. (which he uses appropriately), he has evidently a fair degree of understanding. Nothing appears to escape his notice, and, on my morning round, he is in the habit of persistently directing my attention to any new thing (such as a fresh toy or some change of clothing) which has fallen under his observation since he last saw me. At school he tries to imitate writing on a slate, to match colours, and to join in the drilling exercises of the children. That he is able to carry on a train of reasoning, may, I think, be deduced from the following incident:—A few Sundays ago, having been kicked by one of his companions when walking in the grounds of the asylum, two hundred yards from the house, he left the nurse and children, and ran as fast as he could to the room in which I am in the habit of seeing patients; and ejaculating "Look, look!" would not rest till I had examined his leg, and accompanied him to investigate the circumstances of his injury.'

I several times saw this boy again; he seemed to make little improvement in intelligence. He showed a marked dislike to any attention directed to his head. He never could be got to do any work or even to put on his own clothes. He died of phthisis in 1892, at the age of twenty-nine years. He had attained the height of 56 inches, and the circumference of his head had grown to 15 inches; the weight of the encephalon was 352·5 grammes. His brain was the subject of a most careful examination and description.* With the kind

* *The Brain of the Microcephalic Idiot*, by D. J. Cunningham, M.D., Professor of Anatomy, Trinity College, Dublin; and T. Telford-Smith, M.D., Superintendent of the Royal Albert Asylum, Lancaster, Dublin, 1895. This is the most complete monograph on Microcephaly in the English language. Professor Cunningham, who is an ardent evolutionist, has evidently sought through his

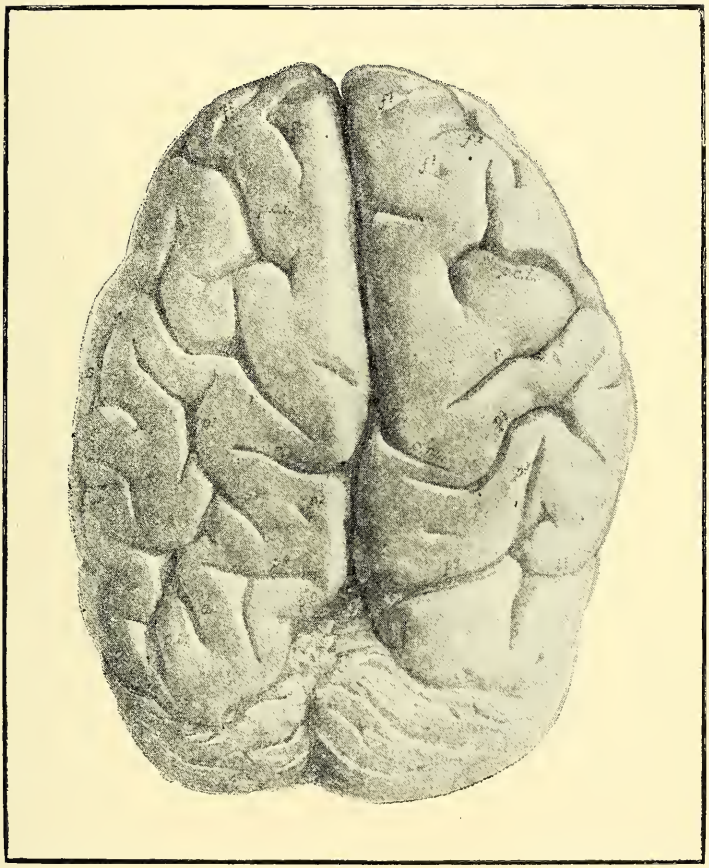
PLATE IX.



Brain of Fred (natural size).

*f.*¹ Sulcus frontalis superior.
*f.*² Sulcus frontalis inferior.
p.c.i. Sulcus præcentralis inferior.
p.c.s. Sulcus præcentralis superior.
r. Sulcus Rolandi.
c.m. Sulcus calloso-marginalis.
p. Sulcus intraparietalis.
*p.*¹ Sulcus postcentralis inferior.
*p.*² Sulcus postcentralis superior.
*p.*³ Ramus horizontalis sulci intraparietalis.
*p.*⁴ Ramus occipitalis sulci intraparietalis.
p.o. Fissura parieto-occipitalis exterior.
a. Sulcus Simii.
*t.*¹ Sulcus temporalis primus.
*t.*² Sulcus temporalis secundus.
o.l. Sulcus occipitalis lateralis.

PLATE X.



Brain of Joe (less than natural size by 17 mm. in length and 10 mm. in breadth).

f.[1] Sulcus frontalis superior.
f.[2] Sulcus frontalis inferior.
p.c.i. Sulcus præcentralis inferior.
p.c.s. Sulcus præcentralis superior.
r. Sulcus Rolandi.
c.m. Sulcus calloso-marginalis.
p. Sulcus intraparietalis.
p.[1] Sulcus postcentralis inferior.
p.[2] Sulcus postcentralis superior.
p.[3] Ramus horizontalis sulci intraparietalis.
p.[4] Ramus occipitalis sulci intraparietalis.
p.o. Fissura parieto-occipitalis exterior.
a. Sulcus Simii.
t.[1] Sulcus temporalis primus.
t.[2] Sulcus temporalis secundus.
o.l. Sulcus occipitalis lateralis.

permission of Dr T. Telford-Smith I am enabled to reproduce one of the engravings which represents the encephalon.

The New York Idiot.

Dr Wilbur, in his Report of the New York State Idiot Asylum for 1857, speaks of a boy twelve years old, rather small of his age; his head is smaller than any whose dimensions I have seen recorded; the greatest circumference of his cranium is only $13\frac{1}{4}$ inches. 'He was not cleanly in his habits, had but little idea of language, was passionate, could not speak at all; he has now been under instruction a year; he can distinguish a variety of forms and colours; he knows the name of all objects in the schoolroom and about the house, and also the names of all the pupils in school; he recognises a great number of pictures of objects; he is beginning to speak, and has already learned several printed words as the representatives of familiar objects; he is now making sensible progress every day. He was in the Asylum for five years,

museum for resemblances between different species of monkeys and the brains of the two microcephales described. Some of the resemblances are found in the brains of the higher apes, others in those of the lower monkeys; but the authors found the greatest similarity of form in the brain of a polar bear. They 'cannot shut their eyes to the possibility that in the brain of Fred we may have a tolerably faithful reproduction of the gyri and sulci which at one time were characteristic of an early stem-form of man.' The question may be asked, If Fred possessed the brain of an ancestral ape or bear, why did he not show corresponding simian or ursine proclivities? or how did the primeval stem-form creature who had a facsimile of Freddy's brain get on without the Royal Albert Asylum? The learned authors consider that their observations strengthen much more the Darwinian hypothesis of the descent of man. It would strengthen the hypothesis if they could reply to the arguments which have been used against it. We might also fairly ask them to collect all the traits and 'reminiscences,' and from them to show what the brain of the stem-form was actually like. Many correspondences may be pointed out between the divers forms of microcephalic brains and bottled specimens of brains of animals lower in the scale; but we can see that the possible downward variations have been already anticipated in the large number of vertebrate species. Brain tissue is not made like plaster-of-Paris to take any shape. It cannot wander beyond some conditions of growth and nutrition which bound its utmost sports of form.

improving in many respects, but the extent of his further progress was so limited that he was dismissed.'

The Aztecs.

The heads of the Aztecs were amongst the smallest known. These creatures have been exhibited in America and Europe for the last forty years. The following description on their first appearance is taken from Dr Dalton's Treatise on Human Physiology:—

'They were boy and girl, aged respectively about seven and five years. The boy was 2 feet $9\frac{3}{4}$ inches high, and weighed a little over 20 lbs.; the girl was 2 feet $5\frac{1}{2}$ inches high, and weighed 17 lbs. Their bodies were tolerably well proportioned, but the cranial cavities were extremely small. The antero-posterior diameter of the boy's head was only $4\frac{1}{2}$ inches; the transverse diameter less than 4 inches. The antero-posterior diameter of the girl's head was $4\frac{1}{3}$ inches; the transverse diameter only $3\frac{3}{4}$ inches.

'The habits of these children, so far as regards feeding and taking care of themselves, are those of children two or three years of age. They were incapable of learning to talk, and could only repeat a few isolated words. Notwithstanding, however, the extremely limited range of their intellectual powers, these children were remarkably vivacious and excitable. While awake, they were in almost constant motion; and any new object or toy presented to them immediately attracted their attention, and evidently awakened a lively curiosity. They were, accordingly, easily influenced by proper management, and understood readily the meaning of those who addressed them, so far as this meaning could be conveyed by gesticulation and the tone of the voice.'

The following account given by Professor Owen describes a later stage—

'The "Aztecs" showed lively but abrupt movements, without obvious aim; the features showed movements devoid of intelligible expression, but with the general actions indicative of internal pleasure or gaiety. When I visited the children in their beds early in the morning, a week after my first inspection of them, they recognised me; I had examined their teeth in the first instance, and the boy pulled down his lip to show them to me on the second visit. They were fond of beating a little drum and jingling a tambourine. They spoke a few words of English and more of Spanish, but seemed incapable of framing a definite proposition; they were pleased with, and attracted by any bright object or toy. They had no sense or instinct of shame. The size of the cranium in the female indicated a brain arrested at the stage of that of the Hottentot Venus, figured by M. Gratiolet.* The Aztecs were stupidly docile; doing what they were bidden, but not in an intelligent way. Mr Gore states, in reference to the woman with the still smaller brain: "Her manners were exactly those of a *very* young child. She could say a few words, and was obedient and affectionate to those about her."'

* Professor Owen said he had seen the skeleton of this woman in the Paris Museum, and, having compared it with those of other Hottentots, was convinced of this being a case of arrested development. See the discussion on the reading of Mr Gore's paper on a Case of Microcephaly in the *Anthropological Review*, vol. i, London, 1863, pp. 168-189. Broca reproduces Gratiolet's drawing of the brain of the Hottentot Venus, and compares it with the brain of a young chimpanzee, the most complicated of the kind observed; but the brain of the Hottentot woman is unmistakably of the human type, and much more complicated than that of the ape. See *Bulletins de la Société d'Anthropologie de Paris*, tome quatrième, année 1869, p. 390.

The French anatomists seem to be generally of opinion that this woman was not an idiot, and this is confirmed by Mr Marshall, who dissected the brain of another Bushwoman, and found the convolutions very simple, and of the same infantile type as the Hottentot; hence he concludes, that 'whilst undoubtedly both brains show an infantile or fœtal leaning, this is to be attributed partly perhaps to sex, but, in the main, to the characterisation of the race itself.'

I have thrice seen these creatures in Scotland, the last time in Glasgow in 1880, where they were being exhibited for a penny. They are at present being shown on the Continent.* They are obviously of American-Indian origin. They have curious heads of black crisp hair which stands out like a brush, starting up after being depressed. They seemed soft and gentle, and spoke a few isolated words. When we asked the male what he would do with some money, he answered, 'cigar,' being fond of smoking. The female said, 'cold,' when the showman exposed her neck to let me see how well nourished she was. They were both of low stature. They were publicly married in London in 1867, and cohabited, but had no offspring. The female showed jealousy of the male by shaking her finger at him 'when he paid attention to other ladies.' The male had a tolerable beard; he had $\frac{16}{14}$ teeth, some of which were decayed. They had both vaulted palates. The male wanted a metacarpal bone in each little finger, and the big toe overlapped the others on each foot. The following measurements of the male microcephale's head were taken as well as we could for his bushy hair.

	Mill.	Inch.
Antero-posterior (from glabella to occipital protuberance)	216	= $8\frac{1}{2}$
Circumference	381	= 15
Transverse (from tragus to tragus)	240	= $9\frac{1}{2}$

The Bird-Man.

The following account has been already published by me in a 'Report upon some Cases of Microcephalic Idiocy and Cretinism,' in the *Edinburgh Medical Journal* for August, September, and October 1875, taken from two articles by Professor Cesare Lombroso, in the *Rivista Clinica di Bologna* (Fasc. 7 Luglio 1873, and Fasc. 11 Novembre 1873).

* The latest account of them is by Dr F. Birkner in *Archiv für Anthropologie*, Band xxv, Nov. 1897.

Lombroso's first case died in the hospital of Cremona. He was rather tall, and his limbs were well proportioned ; but there was atrophy of the testicles, and the beard was wanting at the age of twenty-five. The head was smaller than that of an infant. From some of his habits he was called the bird-man (l'uomo uccello). He chirped, he leaped on one leg, and before putting himself in motion he stretched out his two arms like wings. He used to hide his head under his armpit, and chirped strongly when frightened, or at the sight of a stranger.

He was said to be wanting in touch, taste, and smell, was dirty in his habits, and given to coprophagy. The head was less than that of the ourang-outang or gorilla,* having a circumference of 380 millimetres = 15 inches, and a capacity of 390 grammes. The form was also anomalous. It was oxycephalic, broad at the base, and tapering at the crown, resembling a pyramid, with its vertex corresponding to the middle of the sagittal suture. If a line were drawn from the most salient point of the forehead to cross another thrown out from the fronto-zygomatic suture, it had an angle of 135°, whilst in the average European the angle is about 160°.

The angular processes of the frontal bone were very prominent. The frontal bones themselves were thick, and had a few digitations. The meatus auditorius externus was

* The capacity of the ourang-outang is 448 c. c. for males, 378 for females.

,,	of the gorilla	,, 500	,,	423	,,
,,	of the chimpanzee	,, 417	,,	370	,,
,,	of man-child at birth	,, 400	,,	360	,,
,,	of a male 1 month	,, 460	,,	420	,,
,,	of a male 1 year	,, 900	,,	850	,,

(Vogt, *Mémoires sur les Microcéphales*. Geneva, 1867.) But our Giglioli, in his admirable monograph upon the Chimpanzee brought by Doria and Beccari, describes a maias ciapping, a variety of ourang, with a cranium of 503 cub. cent., and another of 456 c. c. (*Studi Craniologici*. Genoa, 1872). The cranium of an adult microcephale, studied with singular diligence and zeal by Dr Roberti, had a capacity of 370 c. c., a circumference of 332 = 12 inches 7 lines. That studied so learnedly by Valenti had a circumference of 350 mil., equal to 13 inches 9 lines, and the brain weighed 232 grammes.

twice as far forward as in the normal skull. The glenoid fossæ were more converging behind, and less so in front. The carotid foramina were smaller than usual; the molar teeth obliquely inserted instead of vertically. The occipital foramen was carried backwards, and, as noted by Vogt in his observations on Microcephales, in the sardus pithecus and in the sardus Romanus, the distance from the occipital foramen to the alveolar margin stood at 100 in the first, 95 in the second, and in our microcephale at 92, which is no great difference; but if we compare the distance of the posterior margin of the foramen to the most salient point of the occiput, we find it 40 in the sardus pithecus, 60 in the Romanus, and 90 in the microcephale; and whilst, as a rule, in man the length of the base of the cranium is equal to the longitudinal diameter, in our case the difference is from 160 to 140. Tried by the cephalo-orbital index of Mantegazza, this case comes behind the grown-up ourang-outang, and still farther behind the young ourang, and at a distance from man as 8 is from 27. All the sutures were open, even the spheno-basilar one, which was found closed in the skull of the grown-up microcephale studied by Vogt and Mantegazza. This still further weakens the theory of Virchow, who gives so much importance to the closing of the sutures in the production of microcephaly.

I cannot clearly follow the description of the brain, which is much less complete than that of the skull. The frontal lobe looked at in profile seemed to have an irregular margin, and towards the middle line descended with a cleft wide enough to admit two fingers between it and the floor of the skull. The supraciliary lobule is simple, and has no trace of the fissure of Sylvius. The orbital lobe has two gyri on the left side, and three on the right. The posterior lobe is more developed on the right than on the left side, but small on both.

The cerebellum, more developed than usual, was assuredly

not covered in any part by the cerebrum, thus losing a character which is not only common to European, but to the human race.

	Metres.	Inches.	Lines.
Bodily height	1·540 =	60	7
External circumference of cranium	0·380 =	15	0
Internal circumference of cranium	0·350 =	13	9
External longitudinal diameter	0·140 =	5	6
Internal longitudinal diameter	0·120 =	4	9
External transverse diameter	0·113 =	4	5
Internal transverse diameter	0·100 =	4	0
Distance of anterior margin of occipital foramen to alveolar margin	0·092 =	3	7
Cranial capacity	0·390		
Facial angle	65°		

The Brothers Cerretti.

The next three were brothers named Cerretti. The father was a rather tall man, of a scrofulous constitution; the teeth and ears ill formed, and the occiput flattened. The mother, delicate and stupid, had the appearance of a cretin, and suffered from continual headache. One of their cousins was insane, and some had been condemned for homicide. They had eight sons, one only of whom was intelligent; the other seven were all idiots, and four of them died from cerebral diseases. The neighbours thought the cause of so many sons being idiots was that the mother kept a monkey. These microcephales have all a retreating forehead covered in part with down, with an enormous fronto-orbital angle, an obtuse facial angle, and a small oxycephalic head.

The eldest, Nicola, now twenty-four years of age, is rather tall, with enormous ears. The arms are long, owing to the disproportionate length of the forearm. He has no beard, and seems little sensible to electricity. Begging is his occupation, which he does in a persevering manner; but he could never

learn to work. He is tolerably good-natured ; but has very weak intelligence, though not without a certain amount of cunning. He exercises over his brothers a species of guardianship, but more for his own advantage than for theirs. He has absolutely nothing resembling the ape about him, save that he stoops in walking, like a tamed monkey. Serafino, the second brother, is about thirteen. He has the superior canines more developed than normal, and distant from the incisors. Of a malicious disposition, he beats without mercy his little brother, to rob him of his bread and money, and only obeys the bigger brother, grinding his teeth. Giovanni is ten years old. He has an osseous elevation along the sagittal suture. The forehead is covered with hair, or rather down. The upper incisors are larger than usual, and two of the under ones are wanting. The canines are isolated and pointed. He is strong and much more vivacious than the rest ; rolls the eyes quickly like a monkey, touches everything with the hand, and imitates gestures. He has learned to sew and to do little messages. Lombroso could find in none of the three that the sense of taste was normal. They said that assafœtida was good, and musk bad. The little one liked quinine, the others did not. 'It was curious,' says the author, 'to see them going together ; the biggest one with his head bent on his breast and his long arms almost touching the ground, thrashing the others if they did not follow him, but letting Serafino beat Giovanni when he wished to keep what he got in alms.' They bring the bread or money which they get home, but do not give it willingly up to their parents. In winter, having only one coverlet, they fight to have a larger share. Sometimes they wander about four or five days without returning home.

Some of Lombroso's measurements are here reproduced.

		Cerretti.		
		Nicola. Age 21	Serafino. Age 13	Giovanni. Age 10
Height		Metres. Inches. 1·65 = 65	Metres. Inches. 1·35 = 53	Metres. Inches. 1·17 = 46
Weight		Kilogrammes. 56·500	Kilogrammes. 34·00	Kilogrammes. 24·00
		Mill. About in. ls.	Mill. About in. ls.	Mill. About in. ls.
Fore-head. Curves.	Circumference	450 = 17 8	420 = 16 6	410 = 16 2
	Antero-posterior	240 = 9 5	260 = 10 3	250 = 9 10
	Biauricular	220 = 8 8	210 = 8 2	220 = 8 8
Fore-head.	Breadth	100 = 4 0	150 = 5 11	150 = 5 11
	Height	200 = 7 11	300 = 11 10	200 = 7 11
Diameters.	Longitudinal	148 = 5 9	145 = 5 9	140 = 5 6
	Transverse	122 = 4 9	120 = 4 8	110 = 4 3
	Bimastoid	120 = 4 8	110 = 4 3	100 = 4 8
	Bizygomatic	130 = 5 2	103 = 4 0	98 = 3 9
	Fronto-mental	157 = 6 2	162 = 6 4	130 = 5 2
	Occipito-mental	200 = 7 11	186 = 7 3	175 = 6 10
Ears.	Length	60 = 2 4	48 = 1 9	54 = 2 2
	Breadth	34 = 1 3	30 = 1 2	30 = 1 2
Facial angle		68°	70°	72°
Force of fist		88	48	40

Antonia Grandoni.

The most singular of all the cases of microcephaly is without doubt that of Antonia Grandoni. An account of her was given by Professor Cardona,* from which the accompanying portrait is taken. She was born in 1830. She has always had good health; she has her regular periods; 'eats, drinks, and sleeps regularly, and shows attachment to those who are kind to her. She has good sight and good hearing, attends to what is said to her, and gives satisfactory answers; she sometimes smiles, but more to do like those around than for hilarity. She sets herself to work like any other girl.'

* *D'Una Microcefala*, per Filippo Cardona. Milano, 1870.

She weighed about 66 lbs. and was 22 inches round the waist, and 30 inches round the pelvis. Her hair being

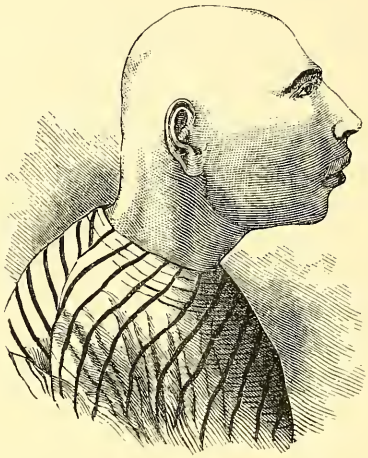


Fig. 3.
Antonia Grandoni.

thin and short, the following measurements could be taken with some exactness :—

	Mill.	Inches.	Lines.
Facial angle	200 =	7	10
Length of the face from the eyebrows to the chin	110 =	4	4
Distance between the zygomatic arches	120 =	4	9
Fronto-occipital	200 =	7	10
Biparietal	200 =	7	10
External circumference	380 =	15	0
Antero-posterior	135 =	5	4
Transverse	105 =	4	2
Line from the sinciput to the base of skull	150 =	6	0

The author gave the measurement of another microcephale called Cioccio :—

	Mill.	Inches.	Lines.
External circumference	340 =	13	4
Antero-posterior diameter	108 =	4	3
Biparietal	98 =	3	10
Line from the sinciput to the base	92 =	3	8

It should be remembered that in the case of Cioccio the examination was made upon the naked bone, whereas in Grandoni the measurements were taken with all the integuments of a living head, and, as seen in the sequel, Grandoni's brain was actually smaller than Cioccio's; but, observes Cardona, 'the smallness of the brain of Cioccio induced stupidity, idiocy, deaf-muteness—in short, simply animal life; the poverty of the brain of our Grandoni in that small size accorded to it by nature, could admit of a sensibility, an intelligence, and an education, which has not fallen much short of the average of her countrywomen.'

Fig. 4.
Antonia Grandoni.

Antonia Grandoni died February 1872, aged forty-one, of pyæmia; the examination of her body was made by five medical men, and the description of Dr Roberto Adriani occupies twenty pages of the *Sperimentale*.* Her father was a boatman; her mother was a woman of small stature, who died of consump-

* *Lo Sperimentale, Giornale Critico di Medicina e Chirurgia.* Firenze, 1872, Ottobre.

tion. Before and after giving birth to Antonia she had several children, male and female, who were quite healthy in every respect. There was nothing in the family history indicating any unusual morbid tendency. Antonia was small at birth, with a small head. The fontanelles were noticed to be distinct, but were thought to contract sooner than usual, and eclamptic convulsions followed. The head, which had increased at first, soon stopped growing, and the disproportion between the size of the head and the face became marked. She was not much later than usual in beginning to walk and speak, but her intelligence was inferior to children of her age. She, however, learned in time to do easy work in the house, and to go out of doors to buy provisions. She was fond of learning amorous poetry, and showed erotic tendencies. On getting older she took to wandering about, and might be seen dancing with grotesque movements to her own singing.

For many years she led a wandering life, an object of curiosity, of pity, or of ridicule to all. At last she was removed to the hospital where she died. There was nothing peculiar about her person saving the smallness of her stature, she being no higher than 52 inches. Cardona says, 125 c. =49 inches 3 lines. Her weight was 30 kilogrammes. She had good sight, very quick hearing, an exquisite sense of taste and smell, and the sensibility of the skin was normal on both sides. The walk was slow and hesitating; but she was a good and agile dancer. She was gay and sociable in her disposition, and never complained, except for bodily pain; but the idea of death disturbed her. She was always quiet and obedient, and when hindered doing anything, she showed grief, but no resentment. She felt for the sufferings of others. She knew that her head was small, and an object of attention. She was very careful in her dress, and was fond of attracting the notice of the other sex. She remem-

bered those who were kind to her, was glad to see them, and would go in search of them when they did not appear. When visitors came to the hospital she desired to be noticed, and was disappointed if she were neglected. She was fond of talking about marriage; liked singing and dancing; could play well upon the cymbals, and was anxious to get her companions to dance to them. She showed a good memory for names of persons and things, remembered places and bygone events; but had no memory of time. She answered questions satisfactorily, adding information without being asked. She had the sentiment of good and evil, and made sensible remarks upon the conduct of her companions. She was religious through imitation and habit, and behaved well in church. Every attempt to instruct her was without success.

It appears from this account, which I have almost literally translated, that Antonia's imbecility was more decided than one would think from the shorter account of Professor Cardona. The description of her mental powers might yet be more complete; one would especially like to know what knowledge she had of numbers, and what was the nature of the attempts at instruction which failed. Apparently she was a poor neglected creature; but, even at the worst, her mental powers appear very extraordinary, if compared with the smallness of the brain. The whole body seemed to have been examined, but no anomalies were noted, save that the pelvis was somewhat narrow, and the coccyx turned to one side. A large number of measurements of the head are given, some of which we reproduce.

Cranio-Facial Measurements.

	Mill.	Inches.	Lines.
External circumference	332 =	13	0
Internal circumference	303 =	11	10
External longitudinal diameter	117 =	4	7
Internal „ „	105 =	4	2

	Mill.	Inches.	Lines.
Distance from the anterior margin of the occipital foramen to the alveolar margin	90 =	3	7
Length of palate	47 =	1	9
Breadth „	30 =	1	3
Breadth of orbits	30 =	1	3
Height „	30 =	1	3
Cranial capacity	370 c.c.		
Cephalic index	75		
Cephalo-orbital index	10·27		

An engraving of the craniographic profile of Broca is given in the *Sperimentale.* The frontal angle is only diminished by 4°, the parietal angle by 29°. The occipital angle is, on the contrary, increased by 9°, so that the total diminution of the cerebral angle is reduced to 24°.

All the sutures were found closed, and taking this in connection with the eclamptic fits, Dr Adriani views this premature closure as the cause of the microcephaly; but much could be said against this explanation, which cannot hold good in many cases.

Amongst all the contents of the cranium, the hemispheres were the least developed. The pons, the medulla oblongata, the tubercula quadrigemina, the peduncles, and the cerebellum fell much less below the ordinary dimensions. The greatest breadth of the brain at the middle was 85 millimetres, and 68 millimetres at the base of the anterior lobes. The cerebral hemispheres were perfectly symmetrical; they were 100 millimetres in length, and were shortened posteriorly, so that the cerebellum was left uncovered for about 70 millimetres. The fissures of Sylvius and of Rolando were well marked. All the cerebral lobes were small; the parietal and occipital were smaller in proportion to the frontal and temporal lobes. The sphenoidal and the anterior and posterior central convolutions were also proportionally well developed. The convolutions of the frontal and temporal lobes were more complicated

and better developed and more numerous than those of the parietal and occipital. The most notable anomaly of the brain was a shortening and slight thinning of the corpus callosum. The dura mater was thicker than usual, and the grey substance appeared to the naked eye in relatively greater quantity. The microscopic examination of the brain, very carefully made by Dr Luigi Severini of Perugia, gave the following results :—

I. No remarkable difference was found in the structure or proportion of the nervous corpuscles, either in slices taken from the posterior parts of the cerebrum where the development appeared arrested, or from the anterior parts.

II. There was a remarkable abundance of fundamental tissue, especially in the cortical matter of the brain, which made the nerve-cells appear scarcer than usual. This tissue, which was thought the same as the neuroglia of Virchow, is described as being turbid, through the small points of obscure molecules uniformly diffused, and taking on a faint colour through imbibition. After prolonged maceration in a weak solution of acetic acid, and separation with needles, this fundamental tissue, viewed with high powers, appeared to be composed of cells with very small nuclei, many of which had very fine processes, so as to resemble the appearance of the cells of the conjunctiva.

III. The prevailing form of nerve-cell in all the slices examined was the triangular one, with an oval or round nucleus. Few displayed the pyramidal form.

IV. The structure of the bloodvessels appeared normal—if anything they were somewhat larger than usual ; and the perivascular lymphatic spaces were very clearly seen.

The whole encephalon weighed 289 grammes ; the cerebrum, 238 grammes ; the cerebellum, pons varolii, and medulla oblongata, 51 grammes. Thus the weight of the brain did not correspond with the cranial capacity. This agrees with the observations of Waisback, who found that the

weight of the brain and the capacity of the skull do not keep a parallel relation, and increase by a different percentage.

The measurement of the convex surface of the brain gave an approximate extension of 1131 square millimetres. This confirms the observations of Wagner, who found that the diminution of weight did not correspond with the diminution of the surface of the brain. As Dr Adriani truly remarks, this case is unique, if we consider the extreme smallness of the cranium, the small weight of the brain, the advanced nervous organisation, and the evolution of the intelligence. Passing over his comparison of the external measurements, we find that, among the cases published, Wagner had one whose brain weighed 300 grammes; Griesinger, one of 576 grammes; Theile, of 294 grammes; Gore, of 283 grammes; Marshal, of 238 grammes in a male idiot ten years old. Gaddi, Bastianelli, and Lombroso have given cases where the weight of the brain was between 300 and 400 grammes.

In none of these did the intelligence approach that of Grandoni; indeed, in all these instances the mental power was of the lowest.

To bring the matter to a closer comparison, let us take the following instances of brains whose weight approached near to that of Grandoni's. The case reported by Gore* weighed only 6 grammes less. She died in her forty-second year. Her height was about 5 feet. She could walk, but with an unsteady and tottering gait, and could only say a few words without any connection; and though her habits were decent and cleanly, she was never able to feed herself.

Dr Mierzejewsky† showed to the Medico-Psychological Society at Berlin the brain of an idiot called Mottey, who died at the age of fifty-six years. His height was 60 inches,

* *Anthropological Review*, vol. i, No. 1, 1863, p. 168.
† *Archiv für Psychiatrie*, Band iv, Heft 1, p. 258.

and his weight was 92 kilogrammes. The circumference of the head was 49 centimetres, the antero-posterior measurement 23 c. The sense of taste and smell were somewhat deficient, the other senses good. He was very apathetic. He spoke a few words of one syllable, and never asked for food, nor seemed put out when it was not brought. The brain weighed 369 grammes, standing in relation to the body as 1250, but the pons and cerebellum nearly approached the normal size. The corpus callosum was three times shorter than usual in proportion to the hemispheres. Nothing abnormal was discovered in a careful microscopic examination of the brain. The pyramids and the medulla were somewhat smaller than usual.

The appearance of the convolutions resembled that of a fœtus in the ninth month, but the brain was larger in volume. Mottey had the intelligence of a child of eighteen months, though the weight and volume of his brain, and the complexity of the convolutions, were considerably less; he had, of course, more experience, and it is likely enough that a child whose cerebral development stood still from eighteen months old would have learned more had he lived till fifty.

Frederick Sohn * had an elder brother who was also microcephalic and less intelligent than himself. Frederick died at the age of eighteen. He could use a few sounds like words, could eat his food with a knife and fork, and could fetch some common article in the room, when so directed by his mother. This seems the sum total of his accomplishments. His principal bad quality was tearing his clothes. The weight of his brain was 452 grammes, that is, 136 grammes more than Grandoni's.

It is needless to observe that Antonia Grandoni was incomparably superior to these three idiots in intellect.

* There is an account of the two brothers in Vogt, *Sur les Microcéphales*, p. 18.

Any one who compares the cranial capacity of a few microcephalic idiots with the intellectual manifestations, will hardly fail to notice that the one does not bear any definite proportion to the other. The cerebral substance must sometimes be inferior in quality as in quantity. In some cases the brain-tissue is healthy, or nearly so; in others it is not. This is a perplexing consideration when we come to study microcephaly, but it is one which cannot be overlooked. Dr Adriani is disposed to think that the brain-tissue of Grandoni was healthy; and he is perhaps right in laying little stress upon what was seen through the microscope, the scarceness of the nerve-cells in proportion to the neuroglia or fundamental tissue; for the import of such appearances is not yet clearly understood.

'It does not require,' he observes, 'a close examination to find the principal characteristics which distinguish the convolutions of man from those of the ape. In the brain of our microcephale, we do not find the perpendicular fissure which divides the brain of the anthropoid ape into anterior and posterior parts. The inferior surface of the frontal lobe is flat, and the convolutions in their division, volume, contour, and disposition have the form of the human type. An examination of the brain strengthens the conclusion that microcephales do not represent a degeneration in the sense of retrogression to the organic type of certain apes, but rather an arrest of development without aberration from the typical laws of organic formation through a pathological cause.' Dr Adriani shows that other observers have found that diminution of the posterior cerebral lobes, and a shortening and thinning of the corpus callosum, are the most constant characteristics of the brain of microcephalic idiots.

He remarks that the defective development of the occipital and parietal lobes did not in this case appear to affect the intelligence, and quotes a case from Griesinger where

there was a moderate and symmetrical diminution of the size of the posterior lobes, so that the cerebellum was in part uncovered; but the young man, far from being an idiot, was endowed with unusual intelligence. In more ways than one does this singular case perplex previously-conceived theories on the functions of the brain.

Helene Becker.

The most careful anatomical description which we have of a microcephale is by Dr Th. L. W. Bischoff* of Munich. The subject was a girl called Helene Becker, who had, when alive, been examined by many German anatomists and physiologists. She was the third child, and the sixth child was also a microcephale. Helene Becker had always a very low grade of intelligence. She knew her own name; but otherwise paid very little attention to what people said to her. She could only speak one word; but used two sounds, a guttural like Eng and a nasal like A, as signs of pleasure. Her cries were highly expressive of pain or anger. She liked to be fondled, and knew when people were angry with her, when she began to cry and became angry; but it was impossible to influence her conduct in any way, and she made no difference between those of her own family and strangers. She distinguished colours and liked bright ones. She was blind of the right eye, apparently from inflammation in early life. The other senses were natural. She never showed any desire for food or drink even when placed before her, and never fed herself, although she relished tasty dishes, and evidently enjoyed different kinds of food and drink. She was very unquiet, always moving her hands and arms and the upper part of her body; but she never executed any regulated

* 'Anatomische Beschreibung eines Mikrocephalen 8 jährigen Mädchens.' Munich, 1873.

movements except sometimes seizing bright objects and raising them to her mouth. She was always delicate, with a weak pulse, low temperature, and cold hands and feet.

About the sixth year she was affected with rickets, and died of a vomica in the lung, at the age of eight years. Her body, which was much wasted, only weighed 7400 grammes. Its length was 782 centimetres.

Dr Bischoff made a careful dissection of the whole body, along with those of two other children of about the same age. The brain only weighed 219 grammes = 7 oz. and 360 grains, and by being kept a fortnight in spirits lost much of its weight, showing that it contained a large proportion of water. With the exception of the brain shown to me by Dr Fletcher Beach,* which weighed 7 oz. = 198·44 grammes, and the one described by Dr Sander, which weighed 170 grammes = about 6 oz., this is the lightest human brain on record.

The brain of a girl of eight who died of phthisis, and whose body was dissected along with that of Helene Becker, weighed 1063 grammes; that of a boy of seven years weighed 1365 grammes. The weight of the cerebellum, pons, and medulla stood to the cerebrum as 1 to 3, *i.e.* 25 per cent. In a four-year-old chimpanzee it was 21 per cent.; in an ourang 20 per cent.; and in a hylobates leuciscus 25 per cent.

No trace of diseased action could be detected in the brain tissue. The convolutions were extremely simple, as may be seen from the accompanying woodcut. But the typical sulci and convolutions could be readily found. The frontal gyri were small, and tapering towards the middle, the temporal gyri were larger. The fissure of Rolando was quite different on the right hemisphere from the left; indeed, it could not be well made out at all on the right side. Bischoff describes

* This child never could stand nor walk. She had to be fed with a spoon. She would recognise with a smile her nurse, and would put out her hands when told to shake hands. She died when twelve years old. An engraving of her brain is in the *Dictionary of Psychological Medicine*, p. 651.

the third frontal convolution as almost wanting, though Dr Aeby is disposed to question this view. The occipital lobes were small.

The corpus callosum was short in relation to the hemispheres, as in the new-born child. The septum lucidum was wanting. The head was not quite symmetrical, the right side being fuller than the left; all the sutures were open

FIG. 5.
Brain of Microcephale, Helene Becker.[1] Side (left) view.

save the sagittal and squamous. This closure of the sagittal sutures, as Giacomini has observed, is frequently met with in microcephales. Marks of rickets were found in the whole skeleton. There is a careful description of all the peculiarities seen in the muscles. These were especially noticed in the arms; but there was no general resemblance to the distinctive arrangement of the muscular bundles in the ape.

[1] The central fissure (of Rolando) runs between *d* and *d*¹.
2¹. The unfinished fissura occipitalis perpendicularis externa.
6. Posterior branch of Sylvian fissure.
11. The parallel fissure.
a. The superior frontal gyrus.
b. The inferior frontal gyrus.
d. Anterior central gyrus.
*d*¹. Posterior central gyrus.
e. Præcuneus.
f. Lobulus supra marginalis.
g. Gyrus angularis.
h. Undetermined.
i. Cuneus.
p. Gyrus temporalis superior.
o. Gyrus temporalis medius.

The left carotid was given off from the innominate artery. It is the arrangement in the ape; but is a common variety in the human species.

The circle of Willis was incomplete, from failure of the right posterior communicating artery.

The liver was unusually small; the valvulæ conniventes were feebly developed. The general result of the whole dissection is considered by Bischoff to bear strongly against the theory of Vogt.

In all variations from the normal structure it is possible to find something like the arrangement which prevails in some of the lower animals, and in this case we have the abductor pollicis longus, and the extensor pollicis brevis which were united as in the ape, and the valvulæ conniventes, which were small in Helene Becker, and are totally wanting in the anthropoid apes; but in most of the variations from the normal human structure no such resemblance could be found. The muscles distinctive of the human being, such as the facial ones, were all present. Under the impression that the trunk and extremities of a microcephale had never been subjected to a minute dissection, Dr Giacomini* made a careful examination of the bodies of Manolino and Rubiolio, two female microcephales. As he tells us, in no case were his hopes more sadly deluded and his trouble worse repaid. He found no abnormalities which could be treated as reversions of type. The peculiarities noticed in the bodies of these two microcephales were much fewer than those found in Helene Becker, and are really not worth repeating.

Professor Giacomini thus concludes his larger monograph, the most complete in any language: Microcephaly cannot be utilised in favour of the theory of descent, for it represents no historical period in the development of man. It does not

* *Una Microcefala*, p. 72.

show anything more than what was already known through other particularities met with in the human organism.

Regnault observes * that in the chimpanzee and gorilla the superior maxillary unites with the frontal bone so as to separate the planum ethmoidale from the lacrymal bone, and an approach to this is met with even in the lower races; but in microcephales the lacrimo-ethmoid suture is found as in the white races.

Joe.

I saw him at the workhouse in Lancaster along with Dr Shuttleworth. He had much of the appearance of an English labourer, being rather tall and strongly made, with hands large but well formed. I gained some additional information about his case from Mr Metcalfe Johnson, a medical practitioner in Lancaster. He had a sister, who had also a very small head. From a drawing which Mr Metcalfe Johnson had made of her, it appeared that she much resembled her brother. He was 5 feet 9 inches in height, and was 34 inches round the chest; but in measuring him we did not take off his shoes or vest. The measurements of the head were more carefully taken.

1. Longitudinal, from glabella to occipital tuberosity, 11 inches = $27\frac{1}{2}$ c.

2. Circumference, 17 inches = $44\frac{1}{2}$ c.

3. Transverse, from one tragus of ear to the other, 11 inches.

4. From tragus of ear to middle of forehead, 5 inches = $12\frac{1}{2}$ c.

5. From tragus to occipital tuberosity, 3 inches 6 lines = $9\frac{1}{2}$ c.

The head was cone-shaped, or oxycephalic, as Lombroso

* *Le Naturaliste*, 1 Mars 1895.

calls it ; the fore part rather better developed than the occiput, though the forehead slanted rapidly backwards. He had a sallow complexion and a long red nose. The palate was not vaulted. He wanted many teeth, which he said had been 'drawed out.' He was said to be forty-five years of age, but had no grey hairs. Until within the last eighteen months he had been able to get enough wages to maintain himself. I believe he had been sent to the workhouse on account of some violence which he had threatened or committed upon a woman with whom he lodged. In the workhouse he was a great hand at loading and wheeling a barrow. His manner was at first hesitating, as if he were afraid of being made game of, but he soon began to be more confiding, when the following conversation took place :—

Q. You are a tall fellow. How high are you ?

Joe. I am 8 feet. I once was taller.

Q. How long was that ago ?

Joe. When I was a soldier.

Q. Were you a dragoon ?

Joe. No, the Cannons.

Q. The artillery. Then were you a gunner ?

Joe. No, I beats the big drum.

Q. How many men have you killed ?

Joe. I broke an Irishman's back once, and buried him alive. I got half-a-crown a day for doing it.

Joe refused to give any further explanation of this exploit, which, it was supposed, referred to some fights between the English and Irish labourers during the construction of a railway line on which our friend worked. Joe then volunteered a piece of information which I was assured was correct.

Joe. A gentleman once left me £10 ; it was after he died.

Q. Were you glad he died, or sorry ?

Joe. I was glad when he died.

Q. Why were you glad ?

Joe. Because he went to Jesus.

Q. Would you like to go to Jesus yourself?

Joe. Yes, I would rather go to Jesus than to the other.

Q. Who is the other?

Joe. (After reflecting a little.) He has horns.

Q. Do you think you will go to Jesus yourself?

Joe. I thinks I will go to Jesus.

Q. Are you always good, and behave yourself?

Joe. The people sometimes teases me, and I gets in a rage. (And pointing to the governor of the workhouse, he added:) *He* tamed me. When the people makes a noise he speaks to them, and tames them.

Joe distinguished a fourpenny-bit from a sixpence. I asked him what piece of money he would like, and he replied: 'Some gentlemans gives me a shilling. I keep it till I have a purse full of money.' He could count his fingers, and said he had five toes on each foot; but did not seem to know much about divisions of time. He was easily puzzled, and said he did not know how many years were in a week. It will be seen that this poor creature had an intelligence, confused and superficial, but decidedly human in character. He had some notion of number, knew of a future state, and had a glimmering of moral relations. I do not know what amount of education he had received.

Joe spent his last years at the County Asylum at Lancaster, where he died of phthisis, aged sixty years. He used to look after the sheep in the Asylum grounds. His brain was not weighed when fresh, but must have been at least one-third heavier than Freddy's, calculated to be about 560 grammes. An elaborate description of the skull, cranium, and contents will be found in the Memoir of Cunningham and Telford-Smith, already cited. The cranial capacity was 620; the frontal lobe was less convoluted than that of Freddy. The foramina at the base of the skull were noted to be very small.

Treatment.

About seven years ago Dr Lannelongue of Paris proposed an operation to facilitate the expansion of the brain, assumed to be hindered by the premature ossification of the sutures, under the expectation of thus being able to effect a cure of idiocy. He operated on twenty-five cases with only one death. The hopes of parents were excited by reports of improvement in the journals. Several children were sent to me by eminent surgeons in the hopes of my being able to observe symptoms justifying operation, but in no case was I able to do so. In France, England, and America, the surgeons were less cautious. It appears from the statistics collected by Bourneville,* that as many as eighty-two idiots were subjected to operations entailing the removal of long strips of bone along the sutures. There were fourteen deaths. I doubt whether there was ever a well-authenticated case of improvement following this bold procedure, founded upon an incorrect pathology. Voisin, who saw twenty such cases, says that the intellectual amelioration so anxiously expected did not follow. Bourneville has shown that in some cases operated upon the sutures were quite open. Indeed, it is extremely difficult in a living child to find out whether the sutures are closed or not. Out of fifty-seven cases operated upon whose characters are not specified, only twenty are declared to be microcephalic. Thus cases of genetous, sclerotic, and hydrocephalic idiocy were treated with the scalpel, saw, and bone nippers of the surgeon. If such operations are to be performed upon the crania of idiots, I should be inclined to restrict them to cases in which there is evidence of compression of the brain in children under five years of age.

* *Recherches Cliniques et Thérapeutiques sur l'Epilepsie, l'Hystérie, et l'Idiotie*, par Bourneville, Paris, 1894. *L'Idiotie*, par le Dr Jules Voisin, Paris, 1893, p. 246.

CHAPTER VII.

HYDROCEPHALIC IDIOCY.

Nature and Symptoms.

HYDROCEPHALUS is the most fatal of the nervous diseases of children; but while many children die of water in the head, and some recover without their intellects being impaired, there are a few who neither die nor recover—they become idiotic. The pressure of the fluid relaxes; the head ceases to increase; Wormian bones are thrown out where the edges of sutures are distant from one another; and the brain to a certain extent recovers from the pressure and stretching which it has received. Sometimes the hydrocephalus is congenital, coming on before, or more often shortly after birth; at other times the hydrocephalus is acquired, coming on in the first few years of childhood. In this case it seldom appears before the tenth month, and is commonest from the fourth to the seventh year.

In some cases the hydrocephalus seems to have a dwarfing effect upon the general growth of the body; sometimes the child is deaf, probably from the lateral expansion of the bones of the cranium, or the increase of fluid between the brain and meatus auditorius internus, causing stretching of the portio mollis.* Occasionally hearing is restored, owing to the

* On the connection between hydrocephalus and deafness, see *Diseases of the Ear*, by John Nottingham, Surgeon to the Southern Hospital, Consulting Surgeon to the Eye and Ear Institution, Liverpool. London, 1857, pp. 498-500. 'The lateral widening of the head,' writes Mr Nottingham, 'which is often noticed in cases of hydrocephalus, must tell upon the acoustic nerves, while the antero-posterior elongation of the head, which would be more likely to affect the optic nerves, is more opposed by the mechanism and strength of the frontal and

tension being relaxed, or to the nerve becoming accustomed to it; more rarely blindness follows water in the head,* perhaps through the pressure of fluid upon the corpora quadrigemina, or in the optic nerves at the tuber cinereum. The wasting of the optic disc or papilla, observed by M. Bouchut, is probably a secondary result. There are even cases in which both deafness and blindness occur. The sense of touch in some cases is dull. Squinting is not uncommon. The voice sometimes undergoes a peculiar alteration; the patient speaks in a lower key, and with a hollow timbre.

From the peculiar form of the head, and especially from the obovate appearance of the crown looked at from above, there is generally little difficulty in recognising hydrocephalic idiots, though it occasionally happens that the head is not larger than usual, where the brain has been much diminished by the pressure of watery effusion; and some men with heads hydrocephalic both in size and shape are possessed of ordinary intelligence. As a general rule, however, hydrocephalic idiots have got larger heads than other idiots, and, indeed, where the head appears to be unusually large, hydrocephalus may be shrewdly suspected. On the other hand, as already re-

occipital parts of the skull, to say nothing of the structure of the nerves of vision, which are much more likely to resist the influences of stretching or of pressure than is the soft material of the portio mollis.

'We now and then meet with cases of blindness, occurring during the progress of hydrocephalus, where the elongation of the head is not more striking than the increase of its width.' P. 500.

* Mr Nottingham's statement that 'deafness is by no means rare, but blindness is not so often met with,' is opposed by Dr Rud. Leubuscher, who in his work *Die Krankheiten des Nervensystems*, Leipzig, 1860, s. 221, says that injury to the sense of hearing is rarer than loss or diminution of the sense of sight. My own experience of hydrocephalic idiocy accords with Mr Nottingham's, but Bourneville is of a different opinion. He observes that 'hearing, smell, and taste did not appear to us to be deeply modified. The most marked cases of hydrocephaly appear to be completely blind. Almost all have a weak vision and are very short sighted.' See the admirable paper, 'De quelques formes de l'hydrocéphalie' (Idiotie hydrocéphalique et ses variétiés), par Bourneville et Noir, *Recherches Cliniques et Thérapeutiques*, vol. xiv, Paris 1894, pp. 175-372. This paper contains some instructive reports and engravings of cases and pathological preparations.

marked, a normal or even a small head is no proof that hydrocephalus had not existed in infancy.

In some cases known to me in which congenital hydrocephalus had been observed in infancy, the head was of the usual size for a child of the same age.

Dr Klebs of Prague believes that hydrocephalus, where the skull is not enlarged, is sometimes owing to mechanical interruption of the local circulation from diminution or occlusion of the foramina at the base of the skull. He has observed cases of born idiocy, with atrophy of the right frontal and temporal lobes, accompanied with diminished power on the other side of the body.

The hydrocephalic head approaches the globular form, the antero-posterior transverse measurements being nearly the same. The widest circumference is often at the temples, where there is sometimes a perceptible bulging above the usual place of greatest width round the superciliary ridges. The back of the head is somewhat flattened, especially about the lambdoid suture, but the palate is not vaulted as is so common with genetous idiots, and the teeth are regular and often good. In asking the history of the case, the period of the closing of the fontanelles should, if possible, be ascertained.

Bourneville describes a scaphocephalic or boat-like form of the head in which the increase of the size of the skull is principally in the antero-posterior direction. In this variety the effusion within the ventricles is generally small.

In hydrocephalus the fontanelle is raised; in rickets it is depressed, and the head is elongated in the antero-posterior measurement. This, and other symptoms peculiar to rickets, are sufficient to preclude confounding the hydrocephalic with the rickety skull. I do not think that in Scotland idiocy is often complicated with rickets. It seems to be otherwise in Norway. Most writers have declared that the intellect in rickets is precocious. Sir W. Jenner, however, opposes this

view. 'Children, the subjects of extreme rickets, are almost always deficient in intellectual capacity and power. They are not idiots; they show no signs of idiocy; they resemble rather children of low intellectual capacity and power much younger than themselves.'

The size of the head does not form a safe criterion as to the amount of injury done to the mental powers. Seguin, in his book on Idiocy, gives the case of a girl seventeen years old, whose head was 37 inches in the largest circumference at its summit, and 20½ inches over the vertex from one foramen auditorium to another. The hydrocephalus commenced in the first year of life. 'She began to speak when five years old. Her senses have always been acute, but she lost her sight five years ago. In 1865 she had spasms for the first time; since, she has grown weaker, and entered already into her period of decay. Though her brain was, we may say, drowned in an ocean of heterogenous fluid, it kept up active communication with the world. She was cheerful, sung and talked until lately, used playthings as ordinary children do, liked to see bright objects waving before her eyes when she could see, and even now in her blindness she amuses herself by making papers rustle and move before her absent vision, muttering yet, though indistinctly, "Hurrah for the colours," "Hurrah for the flag"; touching reminiscences of popular festivities which impressed at an earlier period.'

We thus see that a very large quantity of fluid can accumulate in cases of chronic hydrocephalus without destroying the functional power of the brain. A case has been recorded by Monro of a boy of eight years old, who preserved his memory although the head measured 2 feet 4 inches in circumference. There is also the well-known case of Cardinal, who lived till thirty years. From seven to eight pints of water were found within the cranium, the brain being collected at the base of the skull.

Advancing chronic hydrocephalus may lead to total amentia without being directly fatal.

As Rokitansky has observed, we ought to distinguish between acute or chronic hydrocephalus and hydrocephalus *ex vacuo*, in which fluid oozes out simply to fill up a reduction of the volume of the brain. This is much more common in old age than in childhood. Hydrocephalus has been distinguished into internal and external. In the one, the fluid distends the lateral ventricles; in the other, it is between the brain and the membranes. Hydrocephalus externus alone is not very common; but there are some remarkable cases on record where a large amount of fluid was collected between the skull and the brain, the brain being placed at the base of the cranium. In these cases the intelligence does not appear to suffer so much. It is not unfrequent to have hydrocephalus externus and internus at once. Cruveilhier has remarked that the cerebellum generally escapes from the pressure of the effused fluid. As hydrocephalus leads to obtuseness and dementia rather than to excitement and mania, it is not so commonly seen in the brains examined in asylums.*

Differential Diagnosis.

Hydrocephalus is very likely to be confounded with hypertrophy of the brain, a much rarer malady.

Both diseases cause enlargement of the skull and squareness on its upper aspect, but there are certain differences in the shape which may help us to a distinctive diagnosis. In hydrocephalus we have to do with a fluid which, especially if external to the hemispheres, readily shifts its position and

* I have, in several examinations of idiots, *post-mortem*, seen fluid effused under the membranes—*i.e.*, hydrocephalus *ex vacuo*. Foerster states that hydrocephalus externus alone is rare, but it is not unfrequent to have hydrocephalus externus and internus at once. See *Handbuch der Allgemeinen Pathologischen Anatomie*, Leipzig, 1855; also Cruveilhier, *Anatomie Pathologique*, liv. 5, p. 4, and liv. 8, pl. 6.

distends the skull at its most yielding parts. In hypertrophy we have to do with a solid body growing too quickly and pressing the cranium outwards along its whole surface of increase. Whether this increase takes place equally on every point of the hemispheres it is not easy to say, but in hydrocephalus the greatest circumference is at the temples, and there is generally a greater distance between the eyes, owing to the fluid insinuating itself between and distending the sutures formed by the frontal, ungual and ethmoid bones (Broca's *voussure des dacryons*).

There is also sometimes a small eminence where the wing of the sphenoid joins the anterior angle of the temporal bone (*voussure des pterions*) which is characteristic of hydrocephaly. In hypertrophy there is a bulging on each side above the superciliary region, and no increase in circumference higher up round the temples as in hydrocephalus.

Prognosis.

Hydrocephalic idiots are frequently of very feeble constitution and of a tuberculous or scrofulous diathesis; nevertheless, if in tolerable health, they generally improve under training. They are, as a rule, soft, gentle, and trusting in their disposition, disinclined to exertion of any sort, and somewhat awkward in their motions.

One pupil, who is recorded to have had fits at teething, which returned at four years old, and who has the hydrocephalic character of head, lost his hearing after being several years in the Institution, and gradually lost many of the words which he had learned. He was taught a number of figurative signs, and also to spell on his fingers, and although he had the additional disadvantage of obscurity of sight, having dimness of the cornea, resulting from ophthalmia, his progress was as well marked as that of any pupil in the establishment.

I was once introduced to the governess of a deaf and

dumb school, who had a well-marked hydrocephalic head. She was quite deaf, but the nature of her duties is a sufficient proof that she had retained more than average mental vigour.

Hydrocephalus is not unfrequently combined with epileptic fits, and sometimes with paralysis, and in these cases the prognosis is not so good.

Dr Leubuscher * has recorded some remarkable cases, where consciousness has reawakened shortly before death, which he explains by the supposition of a partial absorption of the effused fluid. I have an account of a girl believed to be idiotic from hydrocephalus, who was noticed to improve mentally during her last illness, which was apparently consumption. Dr Abercrombie quotes the case of a man 'who died of a pound of water in the brain, after having been long in a state of idiocy, but who a short time before death became perfectly rational.'

Illustrative Cases.

B. S. was fifteen years when admitted to the Institution. He was the second child of eight. His father's brother died of phthisis. In his case the hydrocephalus had been complicated by fits, which lasted for six years. They ceased when he was seven years old, and he had none during the five years he was with us. The head was hydrocephalic both in size and shape.

MEASUREMENTS.

Antero-posterior	42 c.
Circumference (at usual place) . .	62
„ higher up . .	63
Transverse	40½
Sum . .	155
From tragus to middle of forehead . .	14
From tragus to occipital protuberance .	15

* *Krankheiten des Nervensystems*, p. 22.

The teeth were not good, and the palate somewhat high, like that of a young child, but not vaulted. The touch and grasp were deficient. He was willing to oblige and do services, and his temper was generally placid and gentle, but he was furious when irritated, though, as he never injured any one, he might have been called, like Condorcet, the enraged sheep.

Fig. 6.
Hydrocephalic and Small-headed Imbeciles.

He learned to add together figures not above six, but got confused when the sum mounted beyond thirty. He improved in general intelligence and the use of his hands. He was taught to read words of two syllables and to spell a few of them. He could not learn to write. In the workshop he

teased oakum, but, from his deficient grasp, never could learn to plait.

B. H., aged seven, the third child of a family of eight, all healthy. At the second month the head commenced to increase, and grow about half-an-inch a week, but never seemed to have increased since he was one year old. Had no fits during teething, but had one when three years old.

He was feeble, slender in make, and only three feet in height, though his head would have been large for a full-grown man.

MEASUREMENTS.

Antero-posterior	39½ c.
Circumference (usual place) . .	51
,, higher up . . .	55
Transverse	40
Sum . .	134½
From tragus to middle of forehead .	12
From tragus to occipital protuberance .	11

The palate was somewhat high. Teeth, $\frac{11}{11}$. He had lost the sight of the right eye, but could see a little with the left. There was a slight squint in the seeing eye. Paralysis had existed for a month in the left eyelid, and then passed away. The hearing was good, and he had the proper feeling in his fingers. He began to walk and speak when between three and four years of age. He was obedient and gentle. His mother, who was a very sensible woman, thought that he possessed the intelligence of a child of three years of age. He had the staid, sober manners often seen with very delicate children. Was only two months under training. Owing to his weakness of sight, his education was conducted in much the same manner as that of the blind. He was taught to count up to twenty, and knew five letters of the raised alphabet when he left.

J. D., the eleventh child of healthy parents ; nothing wrong was noticed till he was three months old, when his head began

to grow rapidly; the fontanelle did not close till he was between three and four years old; began to walk when he was two and a half, but two years after was still unsteady and apt to fall. When examined in February 1891 he was four and a half years old, and only 32 inches high; his head was 20 inches in circumference, and rounded in shape. He had marked internal strabismus. A very peculiar child, quite devoid of shyness, and very garrulous, with a good memory for conversations and for hymns and songs. He is now (January 1898) eleven and a half, but does not look more than six or seven years old. He is weak-minded and given to drollery and mimicry.

Pathological Anatomy.

Meynert gives some rules for distinguishing congenital from acquired hydrocephalus in post-mortem examinations. Hydrocephalus congenitus extends the lateral ventricles in their long diameter, and pushes back the posterior horn, so that it sometimes comes within a few lines of the surface; while hydrocephalus acquisitus increases the ventricles in their vertical and cross diameter. Sometimes the enlarged hollow in the posterior horn becomes filled up by the union of the lining of the ventricle on each side, leaving behind it a cavity containing serum and cysts. The medullary matter forming the walls of the ventricles is hard and tough in congenital hydrocephalus. One may also expect to find Wormian bones in the lambdoid and under parts of sagittal sutures.

The accumulation of fluid deranges the function of the brain both by stretching and pressure. It starves the brain by squeezing out the blood, and leads in the end to atrophy of the nerve substance and hardening of the medullary tissue.

PLATE XI.

J. D., Hydrocephalic Imbecile.

PLATE XII.

Profile and Portrait of J. D.

The pressure is greater where, from closure of the sutures, the walls of the cranium are incapable of expansion.

Treatment.

I am not aware that in the rare instances of arrest in chronic hydrocephales this fortunate event can be traced to any special treatment or known condition. Hydrocephalus is the despair of physicians. Bourneville recommends tight bandaging of the shaved head for alternate weeks, with mercurial inunctions, small doses of calomel every three days, and energetic blistering of the scalp once a month. This medication is combined with well-planned exercise, bodily and mental, massage of the limbs, and saline baths. He claims a signal success in at least one case, a full report of which will be found in the monograph already cited.

CHAPTER VIII.

ECLAMPSIC IDIOCY.

Nature and Symptoms.

THOUGH eclampsia may appear in children of healthy parents, there is no doubt a predisposition, hereditary in some families, to take fits under exciting causes, which cannot be avoided. Convulsions may even affect the infant before birth. The convulsions may occur before teething; sometimes a few days after birth, possibly owing to some injury to the head during labour. It even happens that they do not return with dentition; but the most general, as well as one of the earliest of the exciting causes, is the cutting of the teeth. After this come irritations affecting the mucous membranes of the stomach and bowels. From whatever cause arising, the child is thrown into fits, often long continued, and returning with short intermissions, placing its life in the utmost danger. In the great majority of cases the convulsions pass away, leaving no trace of their occurrence upon the nervous system of the child. Thus, amongst a large number of children who had convulsions at teething, some would die and only a few would be idiots; but amongst a number of idiots a considerable proportion would have convulsions at teething. Dr Shuttleworth, who made some inquiries at Earlswood, found that 14 per cent. of the cases out of idiocy there were ascribed to convulsions at teething; injuries to the head at childbirth standing no higher than 6 per cent. The medical superintendent of a training school for idiots rarely sees these cases in their origin. What he sees is the results of the eclampsic fits several years

afterwards. Observations on the production of eclampsic idiocy by a skilful physician who has much practice amongst children are much to be desired.

Prognosis.

I believe that there is hyperæmia of the brain and membranes which is shown by elevation of the fontanelles, and sometimes by the tâche meningitique. Though the power of muscular motion, as well as the tactile sensibility, is generally well preserved, and special sense does not appear to be injured, the intelligence is in a great degree destroyed, and the child remains, comparatively speaking, uneducable. He can be taught more readily to work than to think. Often the child remains a mute. To this unfavourable prognosis there are exceptions, but relatively not numerous. The remark of a writer* on epileptic insanity seems to hold good with eclampsic idiots. 'No principle has received a greater sanction from experience than that the earlier the age at which epilepsy springs up, the deeper it undermines the organic and moral constitution, and the more disastrous are its results.'

Differential Diagnosis.

Up to the time of the first dentition the disease is probably eclampsic. In eclampsia there is a succession of fits of long duration following close upon one another; after a time the child recovers its bodily health, the fits cease, leaving behind alterations in the structure of the brain, which have disordered and arrested its health and nutrition. In epileptic idiocy, on the other hand, the convulsions recur at more distant intervals; but the disease does not show the same tendency to disappear. A total cessation of the fits is rare, and the physician is generally pleased if he can succeed in

* Dr M. G. Echeverria, in the *American Journal of Insanity*, July 1873.

increasing the length of the intervals between each attack by medical or dietetic treatment.

Illustrative Cases.

Sometimes after the fits there is more or less paralysis of one side, which may never entirely pass away. Of the thirteen cases carefully studied, six could be taught to work a little with their hands; in other things they were of comparatively inferior intelligence. In two the grasp was deficient. In one of these cases the pupil was prevented by imperfect power and insensibility in the hands from learning to work properly, though she was willing and docile, could learn to read a little, and possessed, comparatively speaking, a considerable amount of intelligence. Eight of our eclampsic cases were mutes, or nearly so, and three articulated imperfectly; thus, only two could speak correctly. But of these two, one was a very educable case, a girl who was believed to have been born at the full time, and with neither difficulty nor accident. The fits occurred when she was six weeks old, and were accompanied with febrile action. Her life was despaired of, but the fits passed away entirely, and did not return with dentition. She was a weakly and delicate child, but is now healthy, strong, and active. She entered the Institution at fourteen years of age, and was five years with us. She made slow progress in learning to read, but great progress in learning to work. She could fill brushes quicker than any of the pupils, and was good at sewing, knitting, and household work. There was also a great improvement in general intelligence.

Pathological Anatomy.

When a child is taken with convulsions and dies, Trousseau*

* *Clinique Médicale*, tome ii, pp. 163-164. See also *Diseases of Infancy and Childhood*, by J. Lewis Smith, M.D., Philadelphia, 1872, p. 376.

tells us, one finds on examination a more or less considerable congestion of the membrane of the brain and of the medulla, and a serous effusion in the ventricles or in the arachnoid cavity. Sometimes, too, we find one or two hæmorrhagic spots, and fibrinous clots in the large vessels and sinuses.

I am still at a loss for dissections of uncomplicated cases of eclampsic idiocy; but, from the examinations made by myself as well as those recorded by others, I am inclined to think that the lesions most commonly observed are adhesions of the membranes, some wasting of the gyri, especially of the frontal ones, and the brain tissue harder and tougher than usual.

In those patients who pass into idiocy after severe eclampsic fits, there must surely be a proneness of the brain to yield to degenerative influences, as healthy children can go through a great number of such attacks without apparent damage in after life. Dr Emmet Holt * tells us of an infant who, during the latter six months of its second year, had over 3500 distinct attacks of convulsions. For some time they reached the almost incredible number of eighty a day, and yet the mental condition of the child in the intervals was apparently normal. Dr Holt adds in a note that, as far as the post-mortem examination had gone, they found only degenerative changes in the nerve cells of the cortex in the motor area, and an increase in the neuroglia. These changes existed over quite an extensive area, and were more marked on one side.

* *Diseases of Infancy and Childhood*, p. 656.

CHAPTER IX.

EPILEPTIC IDIOCY.

Nature and Symptoms.

I APPLY this name to those cases where the epilepsy seems to be the cause of the mental obtuseness, for it ought to be kept in mind that congenital idiots are now and then subject to epileptic fits, which need not necessarily have a marked effect upon the intelligence, and can only be regarded as a complication. Epilepsy is one of the commonest causes of insanity as well as of idiocy, and in making our definition of classes it is difficult to know where to draw the line between epileptic idiocy and epileptic dementia. It is inconvenient to draw the line so as to include children under the heading of lunatics, in case they should be sent to asylums for the insane, where there is no proper provision for their training and treatment, and where, owing to their proneness to imitate bad examples, they rapidly deteriorate. If the epilepsy has caused the faculties to become impaired before the age of seven, it appears to me that the patients ought to be treated as epileptic idiots, and I see no practical difficulties to their being admitted to training schools if they be at all educable.

Romberg, Russell Reynolds, and others, have shown that hereditary epilepsy manifests itself at an earlier age than non-hereditary epilepsy; hence one may expect to find a neurotic tendency in the parents of epileptic idiots. In hereditary epilepsy there is an increasing liability in the descendant to have the fits at an earlier age than his ancestor. In twelve out of twenty-five cases, the fits showed themselves the first year, generally during teething; in one case during

the second year, in two during the third, in two during the fourth, and in the rest from the fifth to the seventh year. The most improving cases were those in which the disease commenced after the first year.

In the epileptic attacks of idiots we have both the *petit* and the *grand mal;* the stupefying effects on the mind seem to depend more upon the frequency of the fits than upon their severity. In most cases they come on without any warning; one patient generally complains of headache before the fit; in another there is often a glazed appearance of the eyes, with redness of the sclerotic, paleness of the face, increase of the nodding movement of the neck, and unusual irritability of temper, lasting a day or two before the attack supervenes. It was found necessary to avoid taking this patient into the hall to see the dancing, as it was apt to bring on the fit. Sometimes the exciting cause is a fright, agitation, or indigestion. Krainski has observed that the seizures are preceded by a retention of uric acid in the blood, followed after the attack by increased elimination. He thinks that the spasms are caused by the accumulation of some compounds in the blood against which the organism reacts. Combemale and Bué have found minute organisms, yclept staphylococci, in the blood of epileptics, to which Voisin assigns the rôle of secreting toxine and thus causing convulsions through its influence over the vaso-constrictor vessels of the brain and medulla, and by modifying the protoplasm of the nerve cell. Certainly this is not the only way in which epileptic fits are brought on. Sometimes, though rarely, the imbecile is aware of an approaching attack. On one occasion a boy warned his teacher that he would have a fit, and said that his mother always unloosed his clothes. The fit came on in a few minutes. Another boy sometimes knows that the fit is coming, 'his e'en gangs black,' that is, everything becomes dark to his eyes. This was most likely

owing to a sudden contraction of the arterial vessels of the retina, as was observed to happen some minutes before a fit by Dr Knies, who had a patient upon whom he could make an ophthalmoscopic examination.

Even when the fits are frequent the general health of this class is in most cases vigorous; they have a good appetite, and are physically powerful. It has been noticed in asylums that epileptic lunatics are generally the strongest, and can do most work. In seven cases out of twenty-five there was dulness of touch.

Symptoms and Prognosis.

In mental character they are droll and eccentric; most of the funny anecdotes in an Institution are told of epileptics. They are often wild, intractable, and irritable; in fact, seem to be on the boundary line between idiocy and insanity. Though they generally possess an amount of intelligence apt to deceive those who do not take into consideration the existence of a disease which may be expected again and again to return, they are not easily taught, and are liable to lose what they have learned. If some progress has been made through the unwearied efforts of the teacher, a renewed attack, or series of attacks, has a tendency to wipe the new accomplishments away, and the teacher has to recommence his work over again. However, I am convinced that this unfortunate event is not so common as represented by some writers. With the majority of our epileptics, the continuance of the fits no doubt retards the growth of the intelligence, and the pupils are duller and heavier for a few days after an attack. When this has passed away, they again commence their tasks, and take up their interrupted lessons without any loss of acquired knowledge being noted.

For these reasons, as well as from the sudden and distressing nature of the epileptic fits, and the greater amount of care

and attendance which they require, cases of idiocy complicated with epilepsy have appeared so little promising that they are excluded from the gratuitous benefits of most of the training schools both in Great Britain and America. At the same time this unfortunate class has found its advocates.

Since *Idiocy and Imbecility* was written I have come to set a higher value upon the view of my friend the late Dr W. A. F. Browne, that the subjects of epileptic imbecility, when the epilepsy is successfully treated, form the cases in which there is most decided improvement. I have had some epileptic patients in whom the fits entirely ceased, and in whom there was a remarkable improvement in the mental condition. In other cases the number of fits was clearly diminished by medical treatment and regimen. Many of the epileptics also have made considerable improvement under teaching, though as a rule they are difficult to manage. Nevertheless, I know of no instance of a complete cure—that is, the cessation of the epileptic attacks and the disappearance of the imbecility. Two instances are quoted by me of the disappearance of fatuity attending epileptic fits in a lad of seventeen, and another in a girl of eighteen, after five years' illness. These will be referred to later on as recoveries from epileptic dementia, for, as already observed, the brain suffers more injury at an earlier age. Whatever may be the cause of the epilepsy, its association with idiocy in childhood leads, in my mind, to the presumption that a lesion has been produced in the brain and spinal cord, not likely ever to be effaced, and while the results are sometimes unusually gratifying, like the prizes in the lottery, they are unhappily rare. The number of epileptic idiots that improve is small compared with the number of improving cases in other forms of idiocy, and some of the epileptics fall back. Dr Shuttleworth noted in Earlswood that there were eighty epileptics, and of these between thirty and forty cases were capable of improvement, whereas of the other idiots no more

than 6 per cent. were entirely unimprovable. The rules of the Larbert Institution were not favourable to the admission of epileptic idiots, hence the least promising cases were generally excluded. About one-third improved considerably; in three or four out of ten the fits entirely ceased, with great amelioration in intelligence following. Well-nigh one-third improved a little, while about another third did not improve, or fell back.

It ought to be kept fully in mind that epilepsy may exist without any intellectual failure. Dr Russell Reynolds found this to hold good in 38 per cent. of his cases, and that such a high rate of frequency as 1100 attacks in the year may exist for seventeen years without producing any intellectual change; whereas as low a rate as 72 in the year may damage the mental condition most seriously, and that in five years. 'That the cause of mental failure,' writes Dr Reynolds, 'is not identical with that which induces the attack, is evident from the perfect intellectual integrity of some who suffer severely from the paroxysms, and also from the absence of all direct proportion between the degree of impairment and that of exalted motility. That its cause is, however, closely associated with that of the attacks, is to be inferred from the fact that the degree of failure does bear direct proportion to the frequency of the latter.'

Dr Wildermuth found in the Asylum at Schloss Stettin, that 17 per cent. of the children were quite normal in mind, whereas 83 per cent. had some mental weakness.

Pathologists are in full contradiction about the state of the brain during the epileptic seizure. Some regard the irritation as arising from the cortex, others that it may be induced from a peripheral irritation, or a lesion in the cortical matter stimulating the lower part of the brain, the pons, and the medulla to abnormal action. One theory, of which Hallager* is a recent exponent, treats the epileptic attacks as due to a sudden

* *De la Nature l'Epilepsie.* Paris, 1897.

interruption of the cerebral circulation producing anæmia, probably through the action of the sympathetic on the capillaries. Dr Todorski * has made a series of experiments in Professor Bechterew's laboratory upon animals in which epileptic fits were brought on by the interrupted current, or the essence of absinthe, cinchonine, and other drugs. They found that there is increased pressure during the fit, both in the carotids and jugular veins, with injection of the pia and relaxation of the capillaries. The brain bulged into the hole made by the trephine. They state as the result of the experiments, that during the convulsions there is an increased flow of arterial blood to the brain. There are considerations which appear to support either view. Dr Fletcher Beach once showed to me a patient in the Darenth Asylum who had a deficiency in the skull wall, so that the brain could be felt pulsating under the scalp. When he had an epileptic seizure the brain bulged out through the cleft in the bone during the clonic stage. Beach quotes the experience of Dr Hume, who observed that the pulsation of the brain in the opening left by trephining for traumatic epilepsy ceased during a fit, and the brain became less prominent. We know that convulsions may be artificially induced in animals by rapid bleeding. On the other hand, I have often stopped an epileptic attack by compressing the carotid even on one side, which would only increase the anæmia of the brain. Then, again, fits are sometimes arrested by inhalation of nitrite of amyl, which has been proved to have the power to cause the smaller vessels of the brain to dilate. Doubtless there is a disturbance of the cerebral circulation during the seizure, probably unequal. Then there is a gush of motor and trophic energy, throwing most of the muscles into violent contractions, arousing contractions even of the involuntary muscular fibres, and increased secretion from the glands, a derangement of vital processes,

* *Neurologisches Centralblatt*, No. 16, 1891, and No. 23, 1894.

which have their own modes of action, escaping the usual check of inertia and the guidance of the will. Dr Alexander Robertson, to whom medical science is indebted for so many important contributions, has sustained the view that the pareses sometimes following repeated epileptic fits are owing to exhaustion of the brain from the enormous waste of force. Dr Féré has shown that after a succession of fits there is a loss of functional power in all the senses in feeling, smell, taste, sight, and hearing.* He observes that 'the state of exhaustion of the sensory and motor functions after the epileptic paroxysm sufficiently explains the weakening of the intelligence in general, which is only a complexus of motor and sensory functions.' The intelligence is more than that, and other parts of the brain suffer injury beyond those which have to do with motor and sensory functions.

Pathology.

The loss of consciousness, whatever its cause, is augmented by the toxic effect of venous blood in the half asphyxiated condition often following the convulsions. This condition of the brain may pass away, apparently without leaving any hurtful effect behind. In other cases the power of recovery is not so complete; some injury remains, the effect of the epilepsy, but the cause of the idiocy. The cumulative effects of the lesion, as a general rule, increase with the frequency of the seizure. Bevan Lewis,† one of the most skilful of British microscopists, finds the physical basis of hereditary transmission in an abnormal appearance of the nerve cell and nucleus. He observes that the inflated spheroidal cell of epileptic idiots is a distinct reversion; the protoplasm is degenerated, the cell

* See the admirable chapters, 'Phenomènes d'Épuisement consécutifs aux Paroxysmes,' in *Les Epilepsies et les Epileptiques*, par Ch. Féré, Médecin de Bicêtre. Paris, 1890.

† *A Text-Book of Mental Diseases*, by W. Bevan Lewis, L.R.C.P., M.R.C.S., London, 1889, p. 527.

has fewer branches, the nucleus is changed in form and position. He adds that it is incorrect to regard the convulsive seizures themselves as the agencies whereby the cerebral activities underlying mental evolution are injuriously affected. He regards the convulsive discharge in itself as *not* the factor in the arrest, but simply betraying the nutritional impairment, in itself the origin of the convulsive discharge. 'It is in the structural peculiarity of the cell,' he goes on, 'that we must learn to recognise the origin of the convulsion and of the stunted mental development which such vicious conformation symbolises.'

This pathologist considers the degradation of mind following epilepsy in adult life to be a degenerative affection of the nerve cell, which, apart from this, betrays evidence of a full developmental constitution. For my part I do not deny the subjects of epileptic idiocy an abnormal excitability of the brain, a convulsibility, but my clinical experience has taught me that each fit renders the patient more prone to take another, and carries him down a step towards deeper fatuity, and that something is gained when we save the patient from its recurrence.

Dr Andriezen, who has made a histological examination of the brains of fourteen epileptic idiots at the West Riding Asylum (*British Medical Journal*, 1st May 1897), confirms the observations of Bevan Lewis. He states 'the morbid process underlying epileptic idiocy and imbecility' to be a hardening of the neuroglia fibre cells, diffuse or focal (in the latter case often in the area of a particular vessel), with destruction, slight or greater, advancing to atrophy of the nerve cells. These cells show marked changes, some of which he thinks are due to arrested or altered development. 'Cells from the brains of epileptic imbeciles of adult age (twenty and over) often show in considerable areas a development of the neurons or nerve cells not greater than that of

a healthy child between the ages of three and five.' The nerve cells stain in an abnormal way; the nucleus is often displaced; the protoplasmic processes are few and slender. The changes in the neuroglia cells, too, are easy to recognise, though not so easy to describe. Dr Andriezen also frequently found vacuolation of the cortical cell nuclei, as described by Bevan Lewis. He adds: 'It is by no means intended to state that these changes are restricted to the epileptics who are epileptics and feeble-minded.' We do not blame Dr Andriezen for this reserve, though it dims the distinctness of his definitions; indeed, a little more caution in generalising on narrow grounds of observation might be recommended.

I believe the lesions in the brain of the epileptic idiot to be dilatation of the cerebral vessels succeeded by albuminous molecular deposits outside the capillaries, a gradual destruction of the more delicate nerve cells and fibres, and an increased neuroglia. After more severe attacks of epilepsy slight effusions of blood are produced in the substance of the brain, in the membranes, and in the spinal cord, similar to the ecchymoses which appear in the subcutaneous tissue of the skin. In the brains of some idiots who have died after severe epileptic fits I have found great hyperæmia of the cortex, the pia mater of a deep carmine. In more chronic cases there is wasting of the brain substance, as shown by shrinking of the convolutions and fluid under the pia. The weight of the hemispheres on different sides sometimes shows a marked inequality. Sir John Batty Tuke, M.D.,* has described the brain of an epileptic idiot which weighed as much as 60 oz. This he attributed to the great increase in the neuroglia, and a molecular deposit observed in the vessels.

According to Echeverria† the regions of the encephalon

* 'On a Case of Hypertrophy of the Right Cerebral Hemisphere, with co-existent Atrophy on the Left Side of the Body,' *Journal of Anatomy and Physiology*, vol. vii.

† *On Epilepsy: Anatomo-Pathological and Clinical Notes*, by M. Gonzale Echeverria, M.D., Paris, New York, 1870, pp. 60, 83, and 337.

liable to be first encroached upon by the disease are the floor of the third ventricle, the corpora striata, optic thalami, the convolutional grey substance, and the peduncles of the cerebellum.

Dr Echeverria, who studied the nervous centre in two cases of epilepsy attended with idiocy, remarks: 'The morbid changes on these occasions, as with epilepsy generally, have been of an atrophic nature—diminution of cortical substance and of the nervous elements, with exuberant genesis of connective tissue, undergoing a retrograde or fatty metamorphosis—such may be presumed the kind of degeneration displayed by these cases,'—in fact, very much the same changes as were observed in the medulla oblongata of epileptics. The capillaries were found to be deficient in number, and to have undergone the cretaceous or fatty degeneration.

Treatment.

In epileptic idiocy no time should be lost in putting the child under skilful medical treatment. The bromides of potassium and sodium have a less favourable effect upon the inveterate cases of epilepsy which come into an institution for idiots, or into an asylum for lunatics, than in out-door practice. Nevertheless, I am convinced that this medicine has a marked effect in diminishing the number of fits, and that they again increase when it is suspended. The continual administration of these salts is not without evil effects. They are found infiltrated in the brain, and seem to act by diminishing the excitability of the nerve tissues, but they favour torpor and dulness, and sometimes have a marked effect in injuring the power of walking. I give them in large doses with reluctance. I have again and again suspended their use, and been driven back to use them by the marked increase in the

number of the epileptic seizures. I have tried a great variety of substitutes with little success. Dr Auguste Voisin has stated that oxide of zinc, though it acts more slowly, is a surer remedy than the bromide, and this has been supported by Dr Bertelsmann, the physican of the Asylum for Epileptics at Bielfeld ; but I am sorry to say that oxide of zinc never did so well in my hands, nor had I any success with belladonna, though strongly recommended by Trousseau in his *Clinique Médicale.* I have also tried it in epileptic insanity, and sometimes found the patients made more furious with belladonna but never relieved. In some cases of epileptic idiocy where bromide of potassium failed, I have seen apparent benefit from nitrate of silver. Dr Eustace Smith recommends borax, best administered after food. Combining opium with the bromides in increasing doses, or giving bromides and opium alternately, has come into vogue in Germany. It is said that the perspiration from epileptics has been found to be toxic, hence hot-air baths have been recommended, but hot-water baths are very effective in opening the pores of the skin. Where there is anæmia or a marked tubercular tendency I give cod-liver oil. It is many years ago since I received the advice from Trousseau, at the Hotel-Dieu, to cut off flesh meat from the dietary of epileptics, a view also enforced by Dr Hughlings Jackson. As it is now generally recognised amongst experienced physicians that a meat diet is injurious to epilepsy, I may dispense with the arguments used to enforce this twenty years ago. It is supposed that the nutriment formed from vegetable foods with the addition of milk is of a less excitable or explosive character than that formed when a meat diet is used. In the dietary of idiots in general, milk, not meat, should be the principal animal food, for in all forms of idiocy there is this convulsibility, the tendency to take fits on slight exciting causes. No doubt the gymnastic training given by us is also of advantage. 'During the last three or four

years,' remarks Dr Radcliffe,* 'I have seen several cases of epilepsy, chorea, and hysteria, in which undoubted good has resulted from the adoption of a regular course of suitable gymnastic exercises.' Dr Echeverria also observes: 'Epileptics should not be permitted to remain in idleness; they ought to be made to move about, if they can but walk. Gymnastics, tried as far as the strength of the individual will allow, are of much avail, for by systematically training him or her, we may deeply change the constitution and subdue the nervous system. The exercises should never be continued until fatiguing the patient, lest they might prove injurious. . . . Yet it is needful to their welfare that they devote themselves to some kind of labour, and that they be equally provided for in their intellectual advancement.'

I generally send epileptics back to school a day or two after the stupor following the fits has passed away, since there is no proof that mental exercise does them anything but good.

The remarks of Dr Russell Reynolds hold good for our cases also. 'No more mischievous advice can be given than that which is often uttered in the words, "Let the mind lie fallow; throw away books and all studies, and allow the child or the adult to be crossed in no way, but to do just as he or she may wish or fancy at the time." By these means the habit of attention, the faculties of memory and of self-government, and the intellectual powers generally, are damaged, and that rapidly and seriously. Instead of this plan there should be regular disciplined mental effort, and this not only daily but hourly, of course duly guarded as to time and intensity, and alternated with relaxation. There should be no "strain," but the patient should have to cultivate by exercise the powers of his mind.'

* *Lectures on Epilepsy, Pain, Paralysis, etc.*, by C. B. Radcliffe, M.D., London, 1854, p. 227.

Dr Reynolds considers much reading hurtful, but there is little danger of imbeciles fatiguing themselves by too great mental effort. As a general rule the indolence of the imbecile is a complete safeguard against over-exertion, whether bodily or mental.

Whatever the success of the treatment may be, the patient is never secure against falling back again, save by the total cessation of the epileptic fits. Sometimes the mental powers continue to increase until puberty or later, and then the fits become more frequent, and either bring the sufferer to his end or render him insane. In imbeciles who have recurrence of the seizure at rare intervals I have remarked strange conduct or a return to negligent habits to follow for days or weeks, and then to pass away if attended to and checked.

It is always prudent to explain, when consulted about the hope of improvement of an epileptic imbecile, that a disease still exists which has an unfavourable effect upon the mental condition, and that much improvement cannot be expected unless the fits diminish notably in frequency or cease altogether.

Illustrative Cases.

B. C.—There was often considerable intervals, sometimes as much as two or three months, between the fits. He was always dull and heavy for several days afterwards. His memory was very fugitive, and though an amiable, talkative child, he learned very little. He seemed almost to want the abstract idea of number, and was three years in the Institution before he could be taught to count three.

After having been nearly six years in the Institution, and the fits had become rare, they suddenly recurred with great frequency and severity. After a temporary lull they once more returned, and he died, apparently from exhaustion, in the twelfth year of his age. An examination of his brain was

made, though, from the circumstances of the funeral, of a hurried character. The superficial vessels were much congested ; there were no adhesions. The brain tissue was found somewhat softer than usual. There was no hardening of the medulla. The weight of the brain was considerable, 55½ oz. The skull was somewhat unequal in shape, viewed posteriorly. The sutures were not yet united.

K. Q., ten years of age ; began to speak and walk at usual time. Imbecility said to date from fourth year, when epileptic fits began. They were frequent for three years, but are now rare. Is always anxious to learn something new, so that the difficulty in teaching him is not more than one would find in an ordinary child. He has a bad memory, and loses quickly what he learns. He is greatly improved in speech. When he came, about fourteen months ago, he could hardly talk any. He has learned a large number of figurative signs, and can write and read many words, but articles and verbs puzzle him. He can sew a little and knit to any pattern. He understands form, and is beginning to learn the relations of number. He has little ear for music, though he can dance. He is useful in assisting to dress the other children. Though generally good natured, he resents being found fault with, and is often very sulky. He is given to stealing, but is ashamed when detected.

A. M'C., admitted 17th April to Larbert Institution as a pauper boarder ; parents young people ; no causes indicated save that the mother was 'putten aboot' during pregnancy ; third child of eight, six living, two dead of croup. From birth A. M'C. was small and backward. Fits commenced with teething at six months. Began to walk at thirteen months, and to speak at three years. Senses normal ; could feed himself with a spoon ; obedient, careful of fire ; could talk a little ; marked loss of power in right arm. As he was known to be subject to fits he was treated at once with bromide of potassium,

80 grains a day. On the morning of the 25th April he was found to have lost the power of right leg. The knee was bent, and there were clonic spasms of abduction and adduction, moving the limb to and fro, with a trembling of the foot, also spasms of the costal muscles of the right side. There was facial paralysis of right side. The pulse was quick and weak. He was restless at night; treated with conium and chloral, and blistered on left side of head. Spasms continued to be very frequent; as many as sixty-three were counted in one day. When the fits were confined to one side he was conscious. When more severe, they extended to the whole body, and consciousness seemed lost, or nearly so. During these one-sided convulsions he asked: 'What kind of stuff is it that puts away the fits?' He said that he had a pain in the forehead, but none in the side of the head. The paralysis of the right arm seemed to be increased, and sensation was dull. On the 30th the fits appeared to assume a more trembling character. On the 5th of May he could feel in the right leg when it was agitated by the fits, and even could move it voluntarily. He complained of cold while a fit was going on. In general he could not move right arm, but during the epileptic seizures he could raise it. The temperature was generally about 97° under the left and a fraction higher under the right armpit. On 7th May it was 95°·4 in the hollow of left knee, and 96°·4 in the right; under left armpit it was 96°·3, under right armpit 97°·4; pulse 82. On the 8th the temperature rose to and remained about 100°. The pulse improved, and the fits became less frequent. On the 2nd June he was able to get up and walk about, but the power of the left leg was found diminished, and the right arm hung. The improvement did not last long. The fits became very frequent, and he died about eight months after admission.

Head Measurements.

Antero-posterior		30 c.
Circumference		48
Transverse		30
		108
From tragus to glabella	12 in.	
From tragus to occipital tuberosity	12 „	
Height	50 „	

Testicles wanting.

The head was not noticed to be unequal in size, but the skull was much thicker on the left side. Brain highly hyperæmic, the whole surface vermilion, with deeper red colour in patches over the two left median gyri.

Left median fossa much smaller and narrower than the right. The right hemisphere was bigger than the left. This was best seen behind, where it failed to overlap the cerebellum. The cerebellum looked symmetrical; the pons smaller on the left side. The right anterior pyramid seemed better developed than the left. The olivary bodies were unequal, larger on the right side and more bulbous on the left. The weight of the right side of the encephalon, divided as equally as we could, was $20\frac{3}{4}$ oz.; of left side, $15\frac{1}{2}$ oz.

CHAPTER X.

PARALYTIC IDIOCY.

It is clear that paralysis with idiocy has a cerebral origin. Lesions to the brain causing paralysis may take place before birth as well as after it. Before birth the brain may suffer injuries which would entail loss of life after birth. Hence the cases of paralytic idiocy where there is most destruction to the nervous tissue are congenital ones.

Schroeder van der Kolk* has an interesting case of atrophy of the left hemisphere of the brain occurring in a female imbecile aged twenty-seven. She had from her earliest infancy been paralysed on the right side. The right hemisphere of the brain was quite healthy, but the left was much smaller. The difference of size extended to the base of the brain. The cerebellum was atrophied on the opposite side, that is, the right side, and below the decussation; the atrophy of the spinal cord passed also to the right side from the left hemisphere. The learned author has collected a number of such cases where there was paralysis and diminution of one side of the body, and the opposite side of the brain was atrophied. This appears to be owing to inflammation either before birth or shortly after it. It is to be noted that in these cases when one hemisphere was completely destroyed, the paralysis is not total. The arm is generally more paralysed than the leg.

* See a case of 'Atrophy of the Left Hemisphere of the Brain, with Co-existent Atrophy of the Right Side of the Body,' by J. L. C. Schroeder van der Kolk, translated by W. D. Moore, M.D., Sydenham Society, London, 1861, p. 150.

Also the *Cerebral Palsies of Children*, by William Osler, M.D., London, 1889.

Ueber die halbseitige Cerebral-lahmung der Kinder, von Dr Sigm. Freud und Dr Oscar Rie. Wien, 1891.

Zur Kenntniss der Cerebralen Diplegien des Kindesalters, von Dr Sigm. Freud. Wien, 1893.

Kolk adds—'A remarkable case, where there was probably atrophy of one-half of the brain, is communicated by Wigan in Forbes Winslow's *Journal of Psychological Medicine*. A boy aged fifteen had an inequality of the skull, as if the left half of the brain was cut off from above towards the ear, and was covered with a flat bone, so that the size of the left hemisphere could certainly not amount to more than one-third of that of the right; at the same time he had a tottering gait, without being paralysed. This boy, who at first appeared to be quite idiotic and incapable of learning or understanding anything, with a stupid appearance, had, under constant instruction, three years later grown into a strong lad, and his intellectual faculties were fully developed, while his brain was increasing in size—the left hemisphere, however, always continuing about one-third less than the right.'

In most cases the paralysis affects one side of the body; paraplegia is comparatively rare. The loss of power is sometimes observed at birth. At other times it comes on later, mostly in the first three years of life. The attack is generally preceded by febrile symptoms or repeated convulsions. Sometimes the child is prematurely born, or there is a difficult labour. Girls are as often affected by this disease as boys. As the child gets older and the paralysis is confirmed, it is accompanied by spastic rigidity of the muscles and stiffened joints. In some bad cases the child never puts his feet to the ground, lengthens in his bed as he grows older, the muscles are hard and tense, the tendons like bowstrings, and the joints, fixed in one position, become anchylosed. Where the palsy is less, the child walks on the toes, the heel drawn up. The leg generally recovers power better than the arm. Where the arm is in use there is often athetosis. Sometimes in the arm in which the movements are disordered the temperature is slightly higher, with corresponding rise in the opposite side of the head above the ear. Both limbs are shortened more or

less. The reflexes are exaggerated ; but the electro-muscular reaction is normal. In the ordinary spinal paralysis of children, on the other hand, the electric excitability is lessened, there is loss of the tendon reflex, and rapid wasting of the affected limb without rigidity.

In most cases of cerebral origin in which the paralysis is at all severe the intellectual faculties are blunted, or the child is idiotic. I have seen but few cases of such hemiplegias in which the mental powers seemed perfectly unimpaired. This would imply that one hemisphere of the brain had escaped injury and was fit for healthy function, just as one eye sees as sharply though the other be lost. Schroeder van der Kolk refers to a number of curious cases, going to show that the loss of one half of the brain may be combined with the perfect use of the intellectual faculties. The arterial distribution of the blood in the two hemispheres is separate ; but inflammations are apt to spread through the enveloping membranes; hence it is difficult for one side of the brain to escape entirely.

There may be great inequality in the size of one hemisphere without any inequality in the size of the skull on the atrophied side ; the calvarium is either thickened or the empty cavity is filled up with fluid.

It does not seem to me necessary to make any distinction between those cases where the paralysis has occurred before birth or in early infancy. Indeed, it is sometimes difficult and even impossible to ascertain whether the paralysis was congenital or not. I have had good opportunities of studying one case, where the paralysis must have begun before birth. The head is of average size, and appears symmetrical. There is no deficiency of the senses on either side, but the left side of the body is everywhere smaller than the right. The left arm is more paralysed than the leg, and shorter and thinner than the sound one. The hand is bent upon the forearm, so as to make it quite useless. The left leg is

thinner and shorter than the right, so that he limps, and cannot walk far without exhaustion. This boy, who is now thirteen years old, though decidedly imbecile, has a good deal of shrewdness and some humour; but is slower at school than one would suppose from his conversation. He can read words of one syllable, and is fairly good at music, but deficient in arithmetic.

Cerebral Diplegia or Birth Palsies.

The subjects of these affections of the motor gyri are idiotic or weak-minded, though not always so. In the cases following injuries at birth there is often improvement during the first year. In paraplegia, strabismus is common, and amblyopia sometimes occurs. Dr Freud has found the most common cause of this injury to the motor apparatus of both sides of the body to be meningeal hæmorrhage, especially affecting the veins which open from the pia into the longitudinal sinus, and run for a little way free between the pia and dura. This bleeding finds its way into the great longitudinal fissure, presses upon the upper edges of both hemispheres. The lighter symptoms indicate a superficial pressure; an effusion deep enough to cause injuries to more profound parts of the brain induces the symptoms of spastic rigidity, paraplegia, or cerebral diplegia. Freud has found these affections to be sometimes hereditary. I am inclined to think that such cases may be connected with hæmophilia, well known to be a persistent hereditary disease. Freud observes that the first place in such a family seems to dispose to birth palsies, those who come later to congenital affections.

The patient may present the symptoms of bilateral chorea or double athetosis, or there may be general spastic rigidity of the muscles. In this case the legs are most affected, or there may be paraplegia, or finally cerebral diplegia, the most severe of all these forms in children. The rigidity or loss of

power is of varying degree, and one form passes into another. These motor affections may be of intra-uterine origin, or induced by prolonged labour, or by injuries to the head at birth, or they may be acquired in infancy or childhood. It is generally extremely difficult to make out whether the lesion has been received before or after birth, or from the symptoms to indicate its locality in the brain.

What Duchenne calls pseudo-hypertrophic muscular paralysis is sometimes associated with functional troubles of the brain in different degrees. Drs Langdon Down, Kesteven, and Benedikt have all described cases of muscular hypertrophy, with loss of muscular contractility to the electric stimulus occurring in idiots; but such cases are so rare that the connection of the two diseases may after all be accidental.

Illustrative Cases.

K. U., ten years old on admission, was the eldest of three children. Nothing particular was noticed about him till the eighth month, when he was believed to have become paralytic, and had always been very delicate since. The measurements of head were—

1. From glabella to occipital protuberance . .	31½ c.
2. Circumference	51
3. Transverse	33
Sum .	115½

There was partial paralysis of the arm and leg on the left side. The arm was scarcely ever used; the leg was weak, and dragged after the other. There was also some paralysis of the face on the right side. He slavered a little from weakness of the right lip, and was unable to pronounce the letter K. If asked to say 'cask,' he would say 'as'; if asked to say 'cuddy,' he would say 'uddy,' and so on. He also pro-

nounced the letter G imperfectly, and his voice had the peculiar quavering character often met with in paralytics. The inability to pronounce the gutturals properly was owing to deficient power in the pharynx and soft palate. On being made to try to pronounce K with the mouth open, the uvula was seen to be drawn to the side opposite to that on which the leg and arm were paralysed. Sensibility was deficient on the paralysed side, both to ordinary impressions and to electricity. He could use a spoon, and grasp with the right hand. During the time this boy was under my care, which was about two years and three months, he improved in general health. Both motor power and sensibility increased on the paralysed side, and he learned to use the right hand with more expertness. He could write half text on a slate; but was never able entirely to dress himself. He walked better, and could go farther than when he came. He was regularly exercised in pronunciation, and learned to speak better. He learned to read words of one syllable, and could count and add small sums together. He picked up some notions in physical geography, such as the shape of the world and its relation to the stars, and seemed to have some power of attaining to general and abstract ideas. He was attentive, anxious to learn, of an affectionate disposition, with a strong sense of duty, and was good-tempered, though sometimes obstinate. He appeared to me to have the intelligence of a child of five years of age. K. U. was taken ill in the month of January of bronchitis. There was great prostration throughout the illness, which only lasted five days, when he died in a comatose condition.

The right lung weighed 17¼ oz.; the left, 16 oz.; and the heart, 4¼ oz.

The examination was made two days after death. There were old adhesions of the pleura on the left side. Both lungs showed lesions of acute bronchitis, and some pneumonia at

the base and deposits of miliary tubercle the size of barley-corns. The bronchial glands were enlarged and of a cheesy consistence. There were white deposits of miliary tubercle in both kidneys.

HEAD.—The encephalon weighed 48 oz.; the cerebrum, 42 oz.; the cerebellum, medulla, and pons, 6 oz.

The skull-cap was very thin, the sutures open. The cerebral hemispheres were evidently flattened; the grey matter paler than usual. The lateral ventricles were much distended with fluid; about 2 oz. were taken out and measured, but some escaped. On the roof of the left ventricle, above the posterior cornu, there was a spot of white softening about the size of a walnut. There were deposits of tubercle along the course of the middle cerebral arteries.

T. N., eight years old; a seven-months' child. Mother had a miscarriage through strain. Very small when born; did not at first suck; fed with a spoon, and kept in a box at the fireside for several weeks. Pulls herself about with her arms; can find her way down a flight of stairs, and sometimes across the street, following other children. She now asks people to carry her across. The palate is vaulted; teeth, $\frac{1}{1}\frac{2}{2}$, irregular, not very good. Squints with left eye. The paralysis is worst in right leg.

MEASUREMENTS OF HEAD.

Antero-posterior		33 c.
Circumference		47
Transverse		29
	Sum	109
From tragus to middle of forehead		12
From tragus to occipital tuberosity		11

Fontanelles long in closing. Is fond of music; can count up to 20; knows the use of money; never could learn the alphabet entirely. Frank, good-natured, and confiding.

Her mother, who is a washerwoman, leaves her in the common stair all day when she is out at her work.

X. S., eight years of age. The youngest of eight children. The rest are all alive and healthy. When six months had an illness of which no distinct account was given, except that he was not thought likely to recover, and could scarcely be got to swallow. After coming out of this illness he was noticed to want the power of the right arm and leg. Laugh somewhat unequal, it brings out a slight paralysis in right side of face; slavers from the right lip.

Measurement of Head.

Antero-posterior	36 c.
Circumference	53½
Transverse	34
Sum .	123½

The head appeared to the eye to be unequal. On measuring from the outer angle of the orbit to the middle of the vertex the distance was 14 c. on the right side, and but 12½

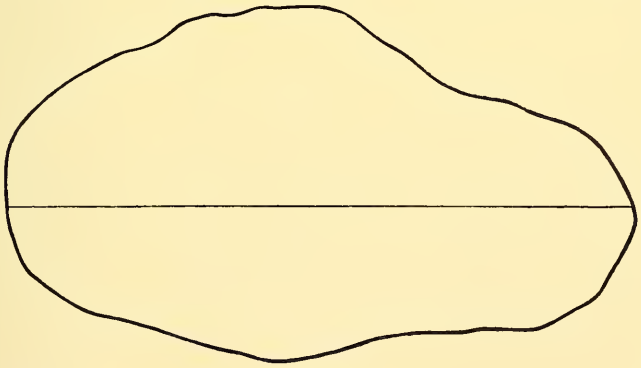


Fig. 7.

Circumference of the head, on a reduced scale, of X. S., taken about the level of supra-orbital ridge and the tuberosity of the occiput, by Dr Clapham, with Conformateur.

on the left side. This was owing to an unusual flatness of the frontal bone a little in front of the coronal suture. There was also a slight flatness on the posterior part of the left

parietal bone, and an irregular contour of the left circumference, as shown in the engraving.

Can be sent little messages. Does not know how to spend money ; but lives in a solitary place away from shops. Could tell if any accident happened to him ; merry and good-natured ; has never received any training.

Dr Klebs gives an account of a grown-up idiot who was employed to frighten birds from the corn. He could speak a few words, and was gentle and docile. His left arm was shorter and thinner than the right, and the left leg was also thinner. There was a want of symmetry in the face or head. On examination after death the right frontal lobe up to the fissure of Rolando and part of the temporal lobe were found to be wanting, and in their place a cavity with smooth walls filled with fluid, bounded below by the optic thalami.

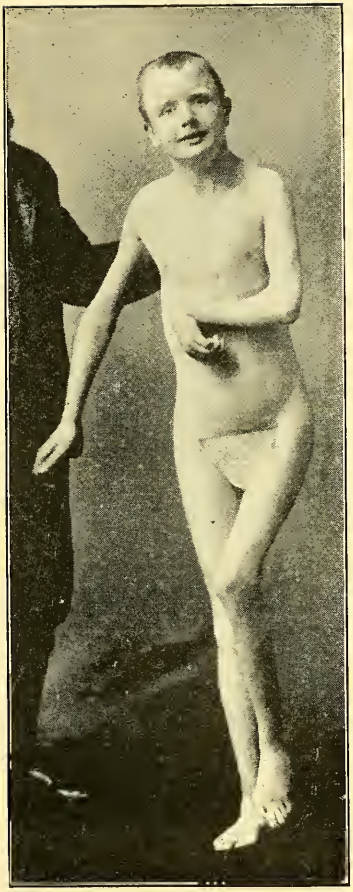
The following description, with photograph, was given to me by Dr T. Telford-Smith, Medical Superintendent of the Royal Albert Asylum at Lancaster.

C. B., aged seventeen years. First-born child; nothing in the parents or birth to explain the paralysis, which is attributed to a fall followed by convulsive seizures when he was beginning to walk and speak, which was as late as two years.

Status præsens.—Speech imperfect and indistinct, generally monosyllabic ; cannot close the left eye. The atrophy on the hemiplegic (left) side is obvious to the eye. The amount was ascertained by careful measurements.

The patellar reflexes are both exaggerated, the left slightly greater; the ankle clonus present in both limbs. The ordinary position of the limbs is spastic, flexed and adducted ; the left arm is drawn up to the side, with the elbow bent at a right angle, and the hand stiffened towards the forearm. The left leg when at rest is drawn up about two inches from the ground and leans against the other limb. He can walk

PLATE XIII.



C. B., Paralytic Imbecile.

about five yards alone; he puts the left foot forward with a slide, then brings the right one down with a stamp; sometimes he starts abruptly, and if not caught would fall.

Pathology.

Most observers are agreed that the initial lesion of cerebral paralysis in children is some degenerative change in the vessels of the brain, endo-arteritis, peri-arteritis, hæmorrhage (often meningeal), embolism, or thrombosis of the cerebral veins. The region most affected is that of the middle cerebral artery, which supplies the motor convolutions. Kundrat thinks that the venous obstruction is sometimes induced in long and difficult labours by overlapping of the edges of the parietal bones, causing pressure upon the sinus. Obstruction to venous return may attend the paroxysms of whooping-cough, or even repeated epileptic fits, which latter, however, Freud regards rather as a symptom than a cause. In the infantile brain the neuroglia seem to have greater resistant power than the more delicate nerve cells and vessels, and the lessening of the vascular circulation often ends in lobar sclerosis. Whether these changes are ever of an inflammatory character is not settled. Vizioli and Strümpell regard cerebral paralysis in children as an affection of the same character as the spinal paralysis (poliomyelitis anterior) in inflammation of the motor areas of the brain, analogous to inflammation of the anterior horns of the cord. Descending degeneration of the nerve tracts has been repeatedly traced from the affected cortex across to the opposite side of the cord. Sherrington has shown that a lesion to one side of the brain, especially in the upper frontal convolution, may be followed by bilateral degeneration of the spinal cord.

Dr Francis Warner recorded a post-mortem examination of a child in whom there was bilateral defective development

of the convolutions behind the fissure of Rolando. Double hemiplegia had existed from birth.

The spastic rigidity is thought to be owing to the over-action of the spinal centres conditioned by the absence of the inhibitory powers of the cortex, but there are instances of this rigidity where there was no sclerosis of the lateral tracts of the cord.

Prognosis and Treatment.

Such cases improve mentally more than physically, just as after an apopleptic shock in which the intellect and powers of sensation and motion are impaired the mental deficiency more readily disappears than the paralysis of motion and sensation. The mental powers can be increased by cultivation, while the paralysed limbs either do not acquire strength, or improve by slow degrees. Nevertheless benefit may be derived from persevering rubbing and vigorous shampooing in the course of the returning circulation, and if the limb does not stir under the influence of the will, by commencing the process by passive movements. Stiffness of the joints should be overcome by vigorous flexion and extension. Sometimes benefit may be derived from orthopædic apparatus in bringing down the heel, or correcting other forms of club-foot. This demands care and thought. The practitioner should consult a good orthopædist, and have recourse only to a first-rate mechanician. Imbecile children will give no assistance in wearing such appliances ; rather the contrary. I have seen several cases of club-feet connected with paralysis of certain muscles, or sets of muscles, sometimes accompanied by shortening of the bone, in which tendons have been cut by surgeons, especially those who call themselves pure surgeons, because they are free from any knowledge of medicine, the only result being a cut difficult to heal in a limb whose vitality is unusually low.

Electricity may be tried upon the paralysed limbs. Some prefer the interrupted current, others the continuous. On the whole, I am disposed to prefer the latter. Faradisation being painful, its habitual application sometimes frightens and agitates the child. The galvanic current should not be applied for more than from five to fifteen minutes, as a long application exhausts the power of the nerve, so that it can no longer transmit the action when it is suffered to rest. In any case rapid improvement cannot be hoped for. Osler observes that in only two cases out of 120 did the paralysis entirely disappear.

I have seen marked benefit from long-continued exercise. Perhaps this is the reason why paralysis of the leg generally improves more than that of the arm, as the patient cannot use the one leg without also using the other, whereas the paralysed arm is likely to be left without any exercise. Imbeciles in general are not fond of exertion, and habitual walking is very unpleasant to them when one limb is weak. We had a boy in the house who bitterly complained of being taken out to walk, and used all sorts of devices to be left behind. He even tried to run away, went to the railway station, and seated himself in a carriage to go home. When asked for his ticket, he said he was a gentleman who had been robbed of his purse in the Torwood. This boy's walking powers in the course of time increased so much that he could hobble five or six miles. On one occasion at a picnic he set off to walk home, a distance of four or five miles, not wishing to wait for the carts. Other examples of improvement might be cited, all flowing from continued exercise and amelioration in the general health.

Porencephaly.

It admits of question whether porencephaly should not be considered under the deficiencies of Genetous Idiocy. Till

its origin is settled it may be more easily treated under the heading of Paralytic Idiocy.

Porencephaly was a word happily applied by Heschl to designate that deformity of the brain in which there is a communication between the lateral ventricles and the surface of the hemisphere. Since Heschl published his memoir on the subject in 1859 a number of cases have been reported, not because the affection is common, but because it is so rare that it is a distinction to have seen an instance of it.*

Porencephaly has been divided into true and false. It would be better to say congenital and acquired.

TRUE PORENCEPHALY is a deformity dating generally from the fifth to the seventh month of intra-uterine life.

Pseudo-porencephaly is owing to a giving way of the walls of the lateral ventricles after birth, owing to a destructive lesion of the cerebral matter between the lateral ventricle and the surface of the hemisphere.

The seat of true porencephaly varies little. The opening generally occurs in that portion of the brain which is supplied by the middle cerebral artery. The gyri most affected are the third frontal, the ascending frontal and ascending parietal, the gyrus supramarginalis, and the first temporo-sphenoidal; when the opening is more extensive the neighbouring convolutions may be invaded. While the arachnoid bridges

* The following are amongst the most important papers :—'Observation de Porencephalie fausse double,' par le Prof. Mierzejewski, *Archives de Neurologie*, Nos. 3 et 4, Paris, 1881. Kundrat, 'Die Porencephalie eine Anatomische Studie,' Graz, 1881. 'On the Spasmodic Paralyses of Infancy,' by James Ross, M.D., *Brain*, 1883, p. 473. 'On Porencephaly,' by Prof. Lambl of Warsaw, in *Archiv für Psychiatrie*, Band xv, Heft 1; and by Dr R. Otto, *Archiv*, Band xvi, Heft 1. 'Kreuser ueber einen Fall von erworbener Porencephalie,' *Allgemeine Zeitschrift für Psychiatrie*, Band xlviii, p. 146, 1892. *Idiotie complète symptomatique de double Porencephalie vraie*, par Bourneville et Dauriac. *Recherches Cliniques et Thérapeutiques*, par Bourneville, vol. xiii, p. 89, Paris, 1893. In the *Journal of Mental Science*, Oct. 1894, there is a description of some cases by Dr Conolly Norman and Prof. Alec. Fraser, and also a list of the literature on the subject.

over the funnel-shaped cavity, the pia mater descends from the circumference of the hemispheres to line the walls down to the ependyma of the ventricles, and from the depth of the pit the gyri laid bare radiate as from the cup of a wheel. The cavity is generally filled with clear serum. The symptoms vary with the parts and the extent of the area affected. Porencephaly generally involves both sides, in some cases only one hemisphere. There is generally paralysis on the side opposite; where both sides are affected there is idiocy, in most cases accompanied by mutism.

After a study of a number of cases, Mierzejewski came to the conclusion that where there is an arrest of development of the median convolutions there always is a paralysis of the opposite side of the body. The case described by the Professor was an idiot of a very low type with stiffened joints, who was carried about in a wheelbarrow and exhibited, to the sounds of a barrel organ, to gain money from the pity or amusement of the crowd.

It must, however, be kept in mind that the basal ganglia have been found in many cases to be smaller on the affected side, and in a few have almost disappeared; secondary descending degenerations do not appear to have been often noticed in congenital porencephaly; but this is perhaps owing to their not having been carefully looked for. They have been frequently observed in the extra-uterine variety. In some cases there is a want of symmetry in the form or arrest in the growth of the cranial bones. Kundrat found that out of eighteen cases of born porencephaly only three lived beyond the period of infancy.

It does not appear to me that a satisfactory explanation of the causes of porencephaly has as yet been presented. Kundrat believes it to be due to anæmia of the Sylvian artery causing inflammation, or softening with reabsorption of the dead tissue; Klebs, that it is due to obliteration of the

fœtal vessels. It can scarcely be due to internal hydrocephalus, as from the funnel shape of the aperture the pressure must have come from without inwards, nor is there observed in the congenital form any traces of loss of substance from within outwards. When we consider the unsupported or undermined condition of the gyri which form the roof of the lateral ventricles we see that there is likely, in this part of the hemisphere, to be a difficulty to nutrition and growth, and where the formative forces are feeble they may be insufficient to bridge over the ventricle. The appearance of the aperture does not suggest an inflammatory process; on the other hand, in false porencephaly, due to encephalitis, hæmorrhage, embolism, or external injury, the lining of the wall of the cavity is rougher, and there are evident traces of inflammatory process and uncompleted absorption.

Dr Ross has given a good description of porencephaly in a little girl who died of croup at the age of two years and five months. At the age of three months her parents first observed that she could not hold her head up, and that her hands were stiff. She never at any time suffered from convulsions. The child was small for her age, but fairly nourished. The legs were kept in a half-flexed condition, the feet extended, and the heels drawn up. The arms were held semi-flexed in a symmetrical position. The muscles of both extremities were in a state of spasmodic rigidity. Any attempt to alter by passive motion the position of the limbs caused increased spasmodic contractions. The head was kept bent forwards, the chin upon the sternum; but she could raise her head by an effort, soon again to fall into the old posture. She could voluntarily grasp an object with each hand, but the movements were irregular and uncertain. She could only utter a few monosyllables.

On examination after death a deep sulcus was found on each side of the brain about the site of the fissure of Rolando,

extending from the point of bifcuration of the Sylvian fissure for about $1\frac{1}{2}$ inch upwards. Each sulcus opened into the corresponding lateral ventricle by an aperture the size of the little finger. Each opening was surrounded by a ring of grey matter having all the naked-eye appearances of the cortex. The ascending frontal and ascending parietal appeared to be absent, and the surrounding gyri were displaced. The crura cerebri, pons, and medulla oblongata appeared quite normal to the naked eye.

Dr Ross tells us that 'a microscopical examination of the matter forming the walls of the cavity shows a structure more or less similar to that of the healthy cortex. The giant cells of the inner division of the third layer of the cortex are, however, absent. This division contains large, round, nucleated cells, but they are entirely destitute of processes; and, indeed, absence of processes is a marked feature of all the cells observed, the cells being in this respect like those met with in the cortex of the brain in the embryo. The spinal cord on microscopical examination appeared in every respect normal, except that the lateral columns were somewhat smaller than the corresponding parts in a healthy cord. The anterior pyramids of the medulla oblongata are not much more than half the size of the pyramids of the medulla from a healthy child of the same age.' In a case described by Bianchi,* a man of sixty-three, who had paralysis of the right side, but did not seem to suffer in intelligence, there was found porencephaly in the left hemisphere. The microscope showed that the cerebral tissues around the funnel had remained in the embryo stage, the pyramidal cells not having attained their full development. In the case of deep idiocy described by Mierzejewski the distribution of the grey matter of the cortex was found to be very irregular.

In 1861 Heschl published another detailed observation of

* *Annales Médico-psychologiques*, tome v, 1887, p. 319.

porencephaly. The subject was a girl not seventeen years of age, who had died of phthisis pulmonalis. Her intellect was not affected, save that the memory was weak. She spoke well, put reasonable questions, and answered with judgment. She had an excellent character. She laboured under a paresis of the right side. The right arm could scarcely execute a few voluntary movements; the fingers were powerless; the right hand was a little flexed upon the forearm, but this could be easily undone. The right leg was dragged upon the ground. The patient complained that the paralysed members were swollen and painful. On examination there was found towards the upper half of the fissure of Rolando two cysts or vesicles, the walls of which were formed by the membranes, and which were filled with a serous fluid. On emptying the upper cyst they found a canal about a finger's breadth which communicated with the lateral ventricles. The neighbouring gyri radiated from the inner orifice towards the margin of the convexity of the hemispheres and even beyond this.

Prof. Lambl of Warsaw has described a case in which one-sided porencephaly went along with an unusual amount of sharpness. Catherine, natural daughter of Marianne Kwiecen, used to go about the district of Nowo Alexandrowsk. Under the guidance of her mother she gained great reputation as a clairvoyant, interpreter of dreams, and healer, and many of the richer people in the country went to consult 'the little witch.' Her grotesque appearance was of service in keeping up such pretensions. Small and weak, somewhat paralysed on the right side, the body leaning to the left, squinting, and with an unsteady gaze, she was ready of retort, cunning, and quick of wit, and knew how to assume a tone of confidence which had its effect upon the country people. Her materia medica was of a striking character, such as to rub the limbs

* 'Ein neuer Fall von Porencephalia,' *Vierteljahrschrift für Pract. Heilkunde*, 1861, p. 105 (quoted by Mierzejewski, *op. cit.*).

with dogs or cats' fat, or to take soup from rats' flesh. Her prescription for phthisis was peculiar: a bath in a decoction of rye-straw, and when the patient had left the tub a cat was to be thrown in. If the cat was drowned the patient would recover, otherwise not. As most cats are active enough to leap out of a tub, this may be thought a roundabout way of conveying an unfavourable prognosis. In 1872 the little witch was brought by the police to the Hospital at Lublin, where she was examined by Dr Schmidt. She was then twelve years of age. He found her very intelligent, with an excellent memory, although she had never been at school. She wandered through the wards, showing great curiosity about the patients, and asked questions from the apothecary about the medicines which they got. The right side was found feebler than the left, and the muscles more weakly developed. She had divergent strabismus with nystagmus; the sight in the left eye was weak. Her appetite was good, the sleep troubled with wild dreams. Examined about her pretensions as a healer and soothsayer, the creature showed considerable tact and cunning in evading searching questions. She said that three years before, when she was looking after some calves in a meadow, she had a vision of a beautiful lady, who soon began to vanish, save the head and hat, and who cried out, 'Be quiet, Catherine; you will no more have to look after calves, but will go about towns and villages curing the sick.' And after she had been two months in the hospital, Catherine confessed that she had been coached by her mother and two other persons, who taught her the names of some diseases and popular remedies, and instructed her how to play her part as a healer and soothsayer. She was kept in the hospital at Lublin, where she died two years after of anasarca. On examining the brain, there was found to be in the left hemisphere a funnel-shaped depression from the upper surface of the cortex, communicating with the lateral ventricle,

which was enlarged and full of serum. The left hemisphere weighed 406·710 grammes, the right 440·054 grammes, the left hemisphere being lighter by 33 grammes. The convolutions of the left side were flattened, the grey matter pale and œdematous, and on microscopical examination the nerve-tissue around the pons was found to be altered and degenerated in structure. Dr Lambl thinks that the strabismus and nystagmus were the results of intracranial pressure, and that the paralysis of the right side was the result of the cerebral atrophy.

It seems at first sight surprising that Catherine should have been possessed of such unusual intelligence, but we ought to take into consideration that there was no proof that the right side of the brain was diseased ; and, indeed, no exact proof that the greater proportion of the left hemisphere was functionally incapable.

Acquired porencephaly is owing to a giving way from softening, hæmorrhage, or other lesion of the area of the cortex supplied by the Sylvian artery. Sometimes the parts supplied by the anterior or posterior cerebral are involved. Though the study of this form has yielded interesting results, yet, as it occurs principally in adults, we need not here consider it.

CHAPTER XI.

TRAUMATIC IDIOCY.

Nature and Symptoms.

TRAUMATIC idiocy ought to be distinguished from inflammatory idiocy, for although inflammation is likely to follow a blow on the head, it may be small in comparison to the damage done by the direct injury which the brain experiences from contusion, incision, division of the nervous tissue, or depression of the skull.

At the same time a small injury might be followed by extensive inflammation, and traumatic idiocy will always be difficult to separate from inflammatory idiocy, but we may in general expect the inflammation to be less diffused and situated around the local lesion.

Of course the degree and nature of idiocy arising from wounds in the head must vary with the amount of destruction of the nervous tissue. In military surgery the prognosis of wounds of the same part would naturally vary with the nature of the instrument which caused them; for example, the arm being carried away by a round shot would be a much graver injury than if it were cut off by a sabre; but injuries to the head causing idiocy happen in so great a variety of ways, and by so great a variety of instruments, that they are not even susceptible of this rude species of generalisation. We have to do with injuries to the unborn child by attempts to procure abortion,* as well as injuries during labour by

* Dr Howe traced idiocy to this cause in at least seven cases out of four hundred (*Causes of Idiocy*, p. 35). Such attempts are not so common in this country as in the United States.

abnormal narrowness of the pelvis and the use of forceps; we have to deal with concussion as well as compression, hæmorrhages from the meninges as well as destruction to the grey or the white matter of the brain. Sometimes the injury to the mental power is permanent, sometimes it disappears more or less slowly; in some cases a trifling injury causes grave disorder, in others what appears to be a great injury leaves no visible effects behind. Hereditary predisposition has, no doubt, much to do with this.

The practice of flattening the head in infancy, though a very absurd custom, is an instructive experiment. These artificial deformations, mentioned by Hippocrates, have been found in ancient tombs in the Crimea and the Caucasus, and even in western Europe. They have been practised by a great number of tribes in America, and by some in New Caledonia, by applying gradual pressure upon different parts of the head. Deformities of a monstrous character have often been thus produced, and it has been confidently stated that the survivors who have been subjected to this prolonged process of deformation are not inferior in intelligence to neighbouring tribes, who leave the heads of their children to grow in the natural way.

M. Broca has pointed out that artificial deformations are even practised in some parts of France, especially in the neighbourhood of Toulouse, by bands tightly tied round the head; the shape of the skull is altered, and sometimes a furrow is noticed in the circumference of the head, corresponding to the site of compression. According to Dr Delaye,* the deformity is well marked in several idiots and imbeciles in the asylum of Toulouse, of which he has the charge. It is clear, however, that this unhappy result is not remarkably frequent, or else the practice would have been long ago dis-

* See *Bulletins de la Société de Paris*, tome sixième, année 1871; Paris, 1872, pp. 127, 128.

continued with so acute and civilised a people as the French. It is said to be by no means rare at Toulouse, though not so common as formerly.

The case of the old Peruvians, already referred to, is noteworthy. Not only is the capacity of the crania small, but most of them are artificially deformed. Out of 730 skulls in the Peabody Museum at Hartford, Dr Wyman selected eleven as apparently the only ones unaffected by any artificial compression or distortion. They were quite symmetrical, but all of small capacity, so that it seems the small space left for the brain is not the result of the artificial deformity.

Most physiologists, if asked what would be the civilisation or intellectual progress of a nation whose heads were smaller than its neighbours', and who practised artificial deformation of the head in infancy, would say that their progress would be small, and their intellectual powers of the very lowest caste. That the reverse was the case is a proof of the extreme difficulty and complexity of the inquiry. In our study of the physiology of the brain, the desire to formulate our knowledge is continually checked by exceptions which occasionally seem to stand in the way even of the vaguest generalisations. It is likely enough that idiots were not uncommon amongst the Peruvians; but the character of their civilisation was probably not favourable to their being brought up. In like manner, the savage tribes who still deform the heads of their children would in all probability never take the trouble to bring up an infant whom this rough process of compression had rendered idiotic. We hear very little of idiocy amongst the nations of antiquity, for ancient legislators considered it a meritorious, or at worst a venial act, to expose them to death in infancy. If Lycurgus or Solon had been told of a people in Atlantis, where all the idiots were educated at the expense of the State, and where healthy mothers, in their keen desire to escape from the 'dependent condition of womanhood,' used

the researches of science to destroy the fruit of the womb, they would have thought the one thing a useless piece of weakness the other an unheard-of mixture of folly and depravity. The one custom is a proof of a great sacredness attached to human life, and a charitable desire to lighten suffering; the other is an outcome of socialistic speculations likely to be the destruction of the nation which suffers such doctrines to spread.

Injuries to the head at birth are often assigned as causes of idiocy; yet the head of the child is not unfrequently subjected to severe compression or injury causing alteration of its shape, and this in the great majority of cases does not lead to such unfortunate results. Nevertheless, in a certain proportion of cases, probably under the influence of constitutional tendencies, such injuries become the proximate causes of idiocy.

It seems likely that the larger size of the head of the male infant, which renders it more liable to compression and injury at parturition, as shown by Sir James Simpson, is the cause of the higher mortality of male children during the first year of life, and especially of their greater liability to diseases of the brain.

'According to Professor Faye,' says Darwin in his *Descent of Man*, 'for every 100 still-born females we have in several counties from 136·6 to 144·9 still-born males. Moreover, during the first four or five years of life more male children die than females; for example, during the first year 126 boys die for every 100 girls—a proportion which in France is still more unfavourable.'

'Diseases of the nervous system,' observes Dr Farre in the Registrar-General's Second Annual Report, 'are 23 per cent. more fatal to males than females, the chief difference arising from the diseases which affect children.' 'At almost every stage of life,' says Dr Stark, the Superintendent of the Statistical Department for Scotland, 'the males in Scotland

have a greater liability to death, and a higher death-rate than females. The fact, however, of this peculiarity being most strongly developed at that infantile period of life when the dress, food, and general treatment of both sexes are alike, seems to prove that the higher male death-rate is an impressed natural peculiarity due to sex alone.'

Idiocy and deafness, both of them hereditary deficiencies, and both the result of diseases of the nervous system, are certainly commoner with males than with females.

'Of 2962 instances,' says Dr Wilde,* 'of uncomplicated congenital mutism, 2512 cases were cases of single mutes in each family, the sexes being in the proportion of 100 males to 73 females, and of these by far the greater proportion were first children.'

In these cases it is easier to understand how the injury to the head of the child, which is generally the most severe during the first labour, should be the cause of idiocy than the cause of uncomplicated deafness. 'It is remarkable,' says the same writer, 'that while the male sex largely predominated in all other instances, the sexes of mutes were equal in eighty-four instances in which the eighth child was born deaf and dumb.' In like manner, it has been observed that the number of born idiots of either sex became about equal when we reached the sixth or seventh child in the family.

Of 2000 children who came under Dr Langdon Down's observation during a space of above eighteen years, 24 per cent. were first-born children. He attributes the preponderance of first-born children to the more exalted emotional life of the mother, and to the greater resistance of the maternal passages and consequent pressure upon the head of the child, and the retarded labour. No fewer than 20 per cent. of all

* See the interesting Appendix upon Deaf-Dumbness in *Practical Observations in Aural Surgery and the Nature and Treatment of Diseases of the Ear*, by William R. Wilde, F.R.C.S.I., etc., London, 1853, pp. 470, 471.

the idiots which came under his observation were born with well-marked symptoms of suspended animation ; but out of the 24 per cent. of the primiparæ, 40 per cent. were born with suspended animation.

In only 3 per cent. were the forceps employed. In every one of these cases the use of the instrument was believed by the parents to be the cause of the idiocy ; but Dr Down found that in nearly all of them there was a neurotic history in the progenitors. Dr Down's statistics are in harmony with Dr Ramsbotham's experience that the use of the forceps is not an important factor in the production of brain disease. He considers that the mental integrity of the child is more likely to be compromised by a prolonged pressure in the maternal passages than by the skilled employment of artificial assistance. Injuries to the head from the use of the forceps have been stated to be the cause of idiocy in from 1 to 2 per cent. My own observations hardly bear out the commonness of suspended animation in idiot children, but Dr Down's experience was larger, and possibly his means of getting correct information were greater. 'While the ratio of sex among idiot primiparæ was three males to one female, the ratio of those born with suspended animation was five males to one female, indicating the influence of the increased size of the male cranium over that of the female.'

I cannot see how Dr Langdon Down strengthened his case by finding out that 24 per cent. of idiots were first-born children, as 24 per cent. of all children in England must be first-born children, and first-born idiots scarcely bore their due proportion to the healthy children of the country, for the average number of children to a marriage in England is 3·9 ; and we ought to remember that first-born are more numerous than other children, as sometimes there are no second-born ones. But Dr Down now states that 6·91, or nearly 7, was the average number of living children born to the parents who

have had an idiot child ; and Dr Grabham* states that he has found that the average number in families into which idiots have been born is greater than four, though he does not give the number. It ought, however, to be kept in mind that if we say the average number of children in families is four, this does not imply that one in every four only is a first-born child, for there are cases where there are no second-born ones. On the other hand, Dr Grabham found that out of 1100 children the proportion of male first-borns was less than that of female ones—23 to 25.

The proportion of first-born children amongst idiots ought to be greater in England than in Scotland, because Scotch marriages are more productive (4·64 to 3·9) ; and the proportion will be higher still in France, where the average of children is still smaller than in England.

Though I am disposed to believe that the increased pressure to which the human head is exposed during labour may be a cause of the preponderance of male over female idiots, there are cases which make me suspect a more occult influence. I know of instances where there were as many as three male idiots in a family, all the girls escaping. If there were a history of difficult labour or suspended animation occurring with the male children and not with the female, the causation would of course be clear ; but this cannot be made out.

It is worthy of notice that cretinism is more common with males than with females,† and there have been more microcephales recorded of the male than of the female sex.

In cases of deaf-dumbness supposed to be congenital, it sometimes happens that in one family the boys are affected, the girls entirely escaping. This not unfrequently happens

* *Remarks on the Origin, Varieties, and Termination of Idiocy*. Earlswood, 1875.

† ' Le crétinisme est plus fréquent chez les hommes que chez les femmes. Ce fait échappe à toute explication.'—Saint-Lager, *Causes du Crétinisme et du Goitre*, p. 10.

with congenital idiots. Sometimes, though more rarely, all the male children escape, and several or all of the female children are born deaf. There is one instance recorded in our case-book where there were in a family three imbecile sisters out of six, and four brothers who were of sound mind, but their ages and order in the family are not given.

The older a child gets the more liable are injuries to the brain to prove fatal; hence the number of cases where idiocy can be fairly attributed to falls or blows upon the head is not large. At the same time, parents are extremely ready to attribute the idiocy of their children to an accidental fall or blow. As such accidents, however, do not often occur till the child begins to walk, and as this is almost always late in the case of idiots, we have here a criterion which ought to be made use of. The medical practitioner ought to make careful inquiries as to the existence of hereditary neurosis, the occurrence of fits, or other diseases likely to be the cause of idiocy, as well as the nature, extent, and immediate consequences of the injury in question. No doubt there are instances of idiocy which must be put down to external violence to the head. Setting aside those occurring at birth, such cases generally belong to the higher grades of imbecility, the amount of injury to the mental power is variable, and they are not easily classified.

Illustrative Cases.

N. X. was the son of healthy parents, in whose family no infirmity of mind had appeared. He began to walk and speak at the usual time, and was a thriving, intelligent child. When four years old he got a fall from a pony, lighting upon the head. There was a depression stretching from the nasal eminence to the middle of the forehead, one and a half inch long, marking the seat of injury. He grew up to be a strong

young man, with a head of good size. He could read and write, and had some knowledge of arithmetic. He was fond of reading amusing books, like the Arabian Nights. He was garrulous and frank in conversation, and not very easily managed. He was distinctly simple-minded, not having more intelligence than a child of eight years of age.

B. N., though late in walking and speaking, was not observed to be idiotic till after a fall on the crown of the head. A cart which she was in was upset, and she was found under, stunned. There is no record of idiocy or insanity in the family. She is well-made, and comely in appearance. She is now eighteen years old. She reads easy books for her own amusement, has learned sewing and knitting, and can do household work.

K. N., aged 13; head small, narrowing towards vertex.* He was the first child; mother sixteen years old at his birth. Born at full time, and delivered with forceps. The marks of forceps were still visible on right temple, where there was a spot destitute of hair. The infant could not suck for the first week. He had three fits a short time after birth, and a great many more when three months old. Has had no fits for three years. He began to walk at two years; can only speak a few words, but understands to a limited extent what is said to him; knows he can get something for money; use of hands deficient; good-natured; apparently healthy.

The mother, a healthy-looking Irishwoman, had five other

* Measurements of Head taken in inches.

Antero-posterior	10½ in.	—266 mm.
Circumference	18½	470
Transverse	11	270
		1006
From tragus to middle of forehead	4½	114
From tragus to middle of occipital tuberosity	4	100

children, all delivered by the forceps. They are all healthy, and said to be of average intelligence.

In this case it would seem as if the injury at birth had been the cause of the fits and the obstruction to the nutrition of the brain, so that it remained no larger than that of a child a year old.

CHAPTER XII.

INFLAMMATORY IDIOCY.

Nature and Symptoms.

INFLAMMATIONS of the mucous membrane of the nose and ears sometimes occur after scarlet fever, measles, whooping-cough, and typhus, and these are the most common causes of deafness which is not congenital. Sloughing of the internal ear sometimes extends through the petrous portion of the temporal bone, causing inflammation of the membranes, and even abscess of the brain itself. Such lesions are generally fatal, and I have met with few cases of idiocy which could be plainly traced to inflammation of the encephalon not caused by external injury. It is certainly not uncommon to hear parents assign the idiocy of their children to some fever in early childhood; but I should certainly reject statements of this kind in which there were marks of genetous idiocy, such as a vaulted palate or irregular and bad teeth. Nevertheless it is extremely difficult for me, who rarely see the commencement of a case, to prove that idiocy, after all, did not precede, instead of following, the fever.

It would appear from the researches of Jastrowitz * and others that inflammation of the brain occasionally occurs before birth, and that this sometimes extends down the spinal cord. Such cases are at present not capable of detection until after death.

The cases of inflammatory idiocy which we have met with were of different grades of intelligence. It is likely

* *Op. cit., supra.*

that the inflammation would be superficial and implicate the membranes and grey matter. The amount of damage to the intellectual powers must be mainly dependent upon the intensity of the morbid process, which we have seldom a direct opportunity of measuring.

Illustrative Cases.

The following example of idiocy, translated from Dr Spurzheim's work on Insanity, is analogous to the post-febrile insanity of Dr Skae's classification. Mr Haslam gives the history of a girl who up to the age of two and a half years was perfectly healthy, of a gay disposition, and of much promise. She was inoculated with small-pox, and during the illness which followed she had convulsions and was continually delirious. When she recovered from the small-pox she had become deranged. Before this she could speak many words, and used them to signify the proper things ; but after, she had forgotten their meanings, and showed no disposition to learn words. She wished to have everything she saw, and cried and was distressed when she did not get what she wanted. Her appetite was voracious, and she ate everything which came in her way, fat or lean, raw or cooked. She amused herself with the fire, and although she often burned her fingers, she would not cease touching it. Her habits became dirty. She had a liking for some people and a dislike to others. She seemed to know the names of some things, such as cake, orange, dinner. At the end of three years her understanding had made no progress.

F. Q. was a boy, admitted in September 1872. He was then thirteen years of age. He was the youngest of a family of thirteen. His birth took place after a very sudden labour ; but there was no proof that it was premature. He was supposed to have been idiotic from birth, and began to walk

when three years old. He had a chronic cough, but was thought to be improving in strength for the last few years. His expression was dull, with an odd face and short, squab figure; his gait was clever and awkward. In length he was 3 feet 8 inches. There was a bruit at the heart with the first sound heard at the base. The pulse was weak and the extremities habitually cold. The fingers were clubbed. The measurements of head were:—

1.	From the glabella to the occipital protuberance .	26½ c.
2.	Circumference	48
3.	From tragus to tragus across vertex . . .	32
		106½

The palate was not vaulted. The ears were thin and membranous.

He seemed to possess all his senses, and often smelt his food before tasting it. He could speak a few words, but only when excited. He used a spoon, could grasp an object, and could tie knots and put in buttons. In character he was somewhat wild and obstinate. His mother said that at home he used to wander away for miles, and had always to be carried back when caught. After admission he was much confined to the sick-room from various ailments, so that little was done in the way of training. He learned to thread beads, selecting the proper numbers and colours, and also to knit a little. He had been getting cod-liver oil for several months, as he seemed to be of a tubercular constitution. When taken ill he was believed to labour under bronchitis and emphysema, as evidenced by heat of surface, increased pulse, cough, expectoration (which he always swallowed), pain in the chest, and breathlessness; sonorous, cooing, and liquid râles, with clearness in percussion. At one spot on the lower side of left lung percussion was almost tympanitic. The heat of skin and increased pulse diminished; but he still continued

to be affected with cough, dyspnœa rising into paroxysms, want of appetite, and wasting. No rise of temperature at night was remarked. He died, after being confined to bed four weeks, apparently from asthenia. He had been in the Institution seven months. During the inflammatory stages of illness he used to make signs as if for a dog, and look for or at it. This was supposed to be a delusion.

The examination of the body was made two days after death. The bronchi were found to be congested, the lungs emphysematous, and speckled through their whole extent with tubercular spots about the size of grains of sago and rice. There were no cavities nor large masses of tubercle, and from the presence of the emphysema everywhere, no dulness on percussion could be expected. The bronchial glands, thymus, mesenteric glands, liver, spleen, and left kidney, all more or less infected or speckled with tubercle. The valves of the aorta and pulmonary artery were deficient, the membranes of the valves unusually thin, and the corpora Arantii wanting. In one of the aortic valves there was a slit in the membrane.

HEAD.—The dura mater was strongly adherent at posterior part of hemispheres, above the occipital tuberosity.

There were about 3 oz. of fluid in the base of the brain.

The pia mater was adherent on both sides to the hemispheres over the region of vertex.

The encephalon weighed	$36\frac{3}{4}$ oz.
The cerebrum	$32\frac{3}{4}$
The cerebellum, pons, and medulla oblongata . .	4

The convolutions were broad and simple, but not shallow; they were not symmetrical. The grey matter was as broad as usual. On the left side the radiating convolutions of the island of Reil were replaced by one simple convolution about

a half-inch broad, running from centre to circumference. On the right side there were two convolutions.

The cleft of the fourth ventricle seemed unusually wide. This appeared to be owing to deficient size of the uvula and amygdalæ.

The weights of the following organs were noted :—Right lung, 23 oz.; left lung, 22½ oz.; heart, 7 oz.; liver, 2 lbs.; thymus gland, 1½ oz.; right kidney, 2¼ oz.; left kidney, 2½ oz.; spleen, 6¼ oz.

This boy seems to have had meningitis either before or immediately after birth, which probably injured the growth and nutrition of the brain. The mutism was, no doubt, owing to the mental fatuity and paucity of ideas.

The following case is given by Dr Auguste Voisin* :—A girl, who, it appears, had no hereditary predisposition to nervous affections, and whose intelligence had gone on increasing in a normal manner up to seven years of age, was seized with a very severe typhoid fever, accompanied by intense cerebral complications. From this time her intelligence was arrested in its development. She derived very little benefit from the education which was given her. Nevertheless she was married ; but she was incapable of managing her house and of doing her domestic duties. In the course of time her imbecility became complicated with sensorial and intellectual delirium, and at the age of thirty years she was sent to the Salpêtrière, where she died through an accidental cause.

The head was badly formed, too narrow at the sides and too high at the crown ; and in the centre of the forehead there was a rounded furrow, which inclined a little to the left. The cranial cavity was increased in size, both at the crown and the base of the skull. The sphenoid bone was hypertrophied, and the small wings were three times larger than usual. On examination with the microscope the osseous

* See *Annales Médico-Psychologiques*, Paris, 1875, p. 133.

cells were found to be enlarged, and most of the Haversian canals contracted. On looking at sections of the grey matter of the frontal convolutions through the microscope, many of the vessels were found to be fatty; the nerve cells were much altered, presenting a pigmentary degeneration; there was atrophy of the protoplasm, disappearance of the secondary prolongations, and atrophy of the axis-cylinders.

Atrophy of the Brain.

Sometimes in cases of imbecility of inflammatory origin years after the acute symptoms are past the patient loses in intelligence and declines in health, slowly sinks, and dies through exhaustion. Sometimes the loss of power is unequal; there is paresis of one side, or loss of power of the lower limbs. After death there is found shrinking of the brain, with fluid under the arachnoid, and the membrane itself opaque in some places; sometimes the shrinking is greater on one side of the brain. I had a boy under my care for seven years; he was born of a healthy family in the North, and was well till he was four years old, when he took a fever called typhoid, with head symptoms, squinting, delirium, and stupor. He came out of it almost blind and imbecile, but lively, droll in speech, and noticing. When about twelve years old he began to take epileptic fits, which gradually became more frequent. His intelligence slowly diminished. Sometimes he used to roar for hours, apparently from pain referred to the top of the head. In the end he sank into a helpless and demented condition, and after lingering for a long time, died through sheer exhaustion, aged eighteen. On examination nothing was found but general shrinking of the hemispheres of the brain, with effusion of fluid under the arachnoid.

There are cases in which inflammation is followed by an opposite condition, abnormal growth of the brain.

Hypertrophic Idiocy.

Hypertrophy of the brain is a rare affection, and pathologists are by no means agreed as to its nature and causes. It implicates the hemispheres, and sometimes extends to the corpora striata and optic thalami, but rarely to the pons or cerebellum.

MM. Espine and Picot hold that it is a general hypertrophy of all the tissues, and not one of the neuroglia alone, as Rokitansky and others advanced. It is certain that there may be hypertrophy, with increase of weight of the brain, with normal intelligence. Sometimes, indeed, the intellect is said to be precocious. Perhaps the pathological process does not always take the same course. At any rate, the brain substance increases, the sutures are closed, and the brain substance becomes squeezed against the unyielding walls of the skull. This diminishes the fluid contents and injures the nutrition of the finer elements of the brain. As the pressure increases there is headache, fits of pain and rage, epileptic attacks, with increased dulness of intellect. Most cases of hypertrophy of the brain seem to die, a few recover, and fewer still take the *via media* of idiocy. I have seen some children so affected at the Clapton and Darenth Asylums, and am principally indebted to Dr Fletcher Beach for my knowledge of this form of idiocy.

The distinctive diagnosis between hydrocephalus and hypertrophy of the brain principally rests upon the observation that in hydrocephalus the increase is most prominent at the temples, and in hypertrophy it is most prominent above the superciliary ridges. In hypertrophy the head approaches the square shape; in hydrocephalus it is rounded. 'In hydrocephalus the width between the eyes is increased. In hydrocephalus there is often elasticity over the late closed fontanelle; in hypertrophy there is none.'

The symptoms of hypertrophy of the brain are graphically presented by Dr Beach * in the following descriptions:—

The boy was born apparently perfectly healthy, but when teething had a fit, and has had them ever since. (This occurrence of fits is not always present.) He was always dull and sleepy, and as a child used to 'bob' his head forwards, *i.e.* let it go forward with a jerk. The head was large when he was born, but the projections on his forehead have since come on. He is a fairly well-grown boy for his age, but has a very vacant look. The head is large, square in shape, and there are well-marked frontal prominences. (These may not always be present.) He complains at times of headache, and points to the right temporo-parietal region when asked where the pain is situated. There is a slight depression, the size of a sixpence, in the region of the anterior fontanelle. He walks slowly and totteringly, hanging his head forward slightly. He cannot stand long at a time; soon he begins to lean forward, and would fall if not supported. He went to school in the Asylum regularly, but made no progress. Questions were answered slowly, and there was a distinct pause before the reply commenced. He suffered much from headache, and gradually deteriorated. Towards the last he became weaker on his legs, and fell about more. Finally he had a number of severe epileptic fits, and died exhausted. On removing the calvaria at the autopsy, the brain sprang upward as if relieved from pressure. It weighed 53 oz., was hard, and cut like cheese. The convolutions were simple in arrangement.

Out of twelve cases which Dr Beach had under his care at the Darenth schools, eight died—four from convulsions, two in a comatose condition, and two from diarrhœa and bronchitis. The brain of one patient, a boy of fifteen, weighed 62 oz.

* 'A Clinical Lecture on Mental Deficiency in Children,' *The Clinical Journal*, August 4, 1897.

Dr Daniel Brunet * describes two cases of hypertrophy of the brain without induration occurring in idiots. The first of these entered the Asylum at Dijon when fourteen years of age, and died three years afterwards, apparently from exhaustion following upon repeated epileptic fits. He had been late in learning to walk, and never spoke, but understood much of what was said to him. He was extremely malicious, attacked animals, children, and even people stronger than himself, and nearly killed one of his sisters with a pick. The epileptic fits at first did not occur oftener than once a year. The brain was hypertrophied, especially behind.

The cerebrum weighed . .	1450 grammes.
Cerebellum	157
Medulla and pons . . .	25
Encephalon . . .	1632

Traces of inflammation were found both in the brain and membranes. The amorphous matter and the myelocytes were more abundant than usual in the grey matter of the brain, and the capillaries were numerous and much injected.

In the next observation the idiocy seems to have dated from the third year. The boy spoke a little, and could do a few messages. He had a younger sister who was also idiotic. The head was large. Having become maniacal when eighteen years of age, he was sent into the Asylum at Dijon, where he died, after a stay of two months and a half, of superficial encephalitis of the anterior third of the brain. The encephalon weighed 1780 grammes. The right side of the cerebrum weighed 820 grammes; the left, 790. As in the preceding

* *Annales Médico-Psychologiques*, Paris, 1874, pp. 187-191.

Culerre describes a case of genetous idiocy with hypertrophy of the brain, and autopsy, in the *Archives de Neurologie*, Janvier, 1887. Bernardini describes another case, a female imbecile whose brain weighed 1755 grammes, and gives a *résumé* of the contributions to our knowledge of this malady in *Rivista Sperimentale di Freniatria*, vol. xii, fasc. 1.

case, there were evident traces of old inflammation of the brain and membranes.

Beach also found that the post-mortem appearances of patients who had died from this disease showed that there was or had been chronic inflammation of the brain. The cranium is often thickened and the sutures firmly united. Culerre and Bernardini both observed an increase in the neuroglia, fatty and pigmentary degeneration of the nerve cells and atrophy of their processes, and a scarcity of the ganglion and pyramidal cells. In some cases the vessels have degenerated. Whether these changes are primary or secondary is not clear.

No treatment has been found of any use against this malady. It appears to me that the experiment of relieving the pressure by trephining at some points might be justifiably tried.

CHAPTER XIII.

SCLEROTIC IDIOCY.

THIS form was first described by Bourneville* about fifteen years ago. Since then he has carefully worked out its clinical symptoms and its pathology. He regards it as a rare form, and I have not met with many examples, but it seems to be relatively commoner in America. Dr Wilmarth† found sclerotic changes in one-fourth of the hundred brains of feeble-minded children which he examined, which he thus specifies :—Sclerosis with atrophy was found in twelve cases, sclérose tubereuse in six, diffuse sclerotic changes in seven, and glioma with sclerosis in one case. The predisposing causes of sclerosis seem to be the tubercular diathesis, neurotic tendencies in the progenitors, as shown by insanity, hemicrania, and other neuropathic diseases, and alcoholism. As exciting causes are given, accidents befalling the mother before birth, difficult and prolonged labour, asphyxia, and injury to the head of the child after birth. The affection sometimes shows itself in the first few days and generally before the first twelve months, though it may be delayed till the second year, and later. The frontal and occipital lobes seem to be more often affected than the central ones. As long as the motor areas are spared the symptoms may not be sufficiently

* *Archives de Neurologie*, tome i, pp. 81 and 397 ; also, *Recherches sur l'Epilepsie, l'Hystérie et l'Idiotie*, par Bourneville. Paris, 1882.

† See 'Report on the Examination of One Hundred Brains of Feeble-Minded Children,' by A. W. Wilmarth, M.D., Elwyn, Pa., in *Alienist and Neurologist*, St Louis, October 1890 ; also, *Twelfth Annual Report of the Committee on Lunacy of the Commonwealth of Pennsylvania* for 1894, p. 114.

marked to attract much attention. The symptoms which attract attention are repeated spasms, sometimes implicating particular groups of muscles or passing into general convulsions. There is seldom much rise of temperature. There is an exaggeration of the patellar reflex. Sometimes the convulsions are predominant on one side, which is held to indicate that the sclerosis has invaded the motor cortex. This is followed by loss of power, with paralytic attitudes, or hemiplegia more or less decided, and contractions which can generally be undone. This is accompanied by atrophy of the brain and the usual symptoms of idiocy: dulness and apathy are found, inattention to sight and sound, helplessness, lateness in walking and speaking. Sometimes the idiocy is very profound; it may be complicated with blindness. The spread of the affection is indicated by the prevalence of the fits and the increasing mental torpor. The symptoms scarcely ever indicate improvement, though sometimes the march of the disease seems arrested for a year or two. The patient generally dies before the age of puberty.

Diagnosis.

In the diagnosis Bourneville lays much stress upon the appearance of contractures following repeated convulsions. There is no sudden paleness, no aura nor cry, nor stertorous respiration, as in ordinary epilepsy.

Sclerosis is distinguished from meningitis by the absence of grinding of the teeth, of bursts of rage, of cries of pain, or of boring the head in the pillow. The head is generally small, and sometimes asymmetrical or deformed. The palate is generally normal.

Pathology.

Several varieties of sclerosis have been described: *sclérose*

atrophique, a fibrous kind, composed of hard, white masses of shrunken tissue ; and tuberous or hypertrophic sclerosis, which is considered the most destructive.

On removing the membranes of the brain, the scattered whitish sclerotic masses are seen elevated above the cortical tissue, which is of a salmon colour. The pia mater is not adherent over the sclerosed masses ; sometimes it is over the remaining cortical tissues. The gyri are crowded against one another, so that the separation of the sulci is much effaced. The sclerotic process mainly affects the cortex, though the white matter is sometimes involved. The corpora striata are sometimes affected. The weight of the brain is often rendered unequal by atrophy of one side ; Bourneville * has noted a case in which the left hemisphere weighed 125 grammes less than the right. In another case the difference was as great as 260 grammes, the right hemisphere weighing 460 grammes, while the left hemisphere only weighed 200 grammes. In the atrophic form the shrunken cortex reminds one of the lesions in general paralysis.

Besides the atrophic and hypertrophic or tuberose forms, Bourneville has indicated other subdivisions of idiocy, based upon the manner in which the sclerosed deposits have been diffused through the brain : † sclerosis of one hemisphere or of both hemispheres, sclerosis of one lobe of the brain, sclerosis of isolated convolutions, and sclerosis in patches (*sclérose chagrinée du cerveau*). I am not aware how far this physician has defined the symptoms of these varying diffusions so as to enable us to recognise them in the living subject.

* *Recherches Cliniques et Thérapeutiques sur l'Epilepsie, l'Hystérie, et l'Idiotie*, par Bourneville, Médecin de Bicêtre, p. 222. Paris, 1893.

† See *L'Idiotie*, par le Dr Jules Voisin, p. 77. Paris, 1893.

CHAPTER XIV.

SYPHILITIC IDIOCY.

SYPHILIS is rarely a cause. Fletcher Beach in 2400 cases amongst the pauper idiots of London found it in only 1·17 per cent. Langdon Down and Kerlin found that in not more than 2 per cent. were these cases of inherited syphilis. Shuttleworth found it in ten cases out of 1000; but in only four of them could it be surely assigned as the cause of the idiocy. With so common a malady, one might suppose that we should find its traces in complication with the various forms of idiocy oftener than we really do. Dr Heubner * observes that the brain and nervous system seem in fœtal life to escape infection from syphilis, or to suffer from it extremely seldom. But although, as a rule, this disease seems to spare the nervous system to a remarkable degree, yet under some obscure influence it occasionally attacks it, for patients suffering from luetic affections of the brain and spinal cord find their way into our hospitals and even into our lunatic asylums. There is sufficient evidence that syphilis is a potent predisposing cause of general paralysis, though, considering the frequency of the one disease and the comparative rarity of the other, it is clear some peculiar concatenation of influences is needed to produce so dreadful a result.

I myself have met with but a few instances in which this malady appeared to have been the cause of the idiocy, and

* *Syphilis Hereditaria Acquisita Tarda*, von Dr Otto Heubner, Tübingen, 1896, p. 36.

the following sketch is mainly taken from the writings of some physicians who have had more opportunities.*

The parents are infected, and there is generally a great mortality amongst such children as come into the world alive. The infant in question has skin eruptions, snuffling, and other luetic symptoms; but shows normal intelligence up to a certain age, from three to nine years. In most cases about the time of the second dentition the symptoms of nervous disease appear—headache, nystagmus, epileptiform seizures, or paretic attacks. There is a decline of health and a decrease in the intelligence, ending in utter fatuity. The child becomes more and more helpless, and generally dies in four or five years.

Dr Bury remarks that this form falls more correctly under the heading of dementia than under that of idiocy.

It is true that in most cases of idiocy there is an upward tendency, a slow progress towards improvement, and in these luetic patients there is mostly the reverse; yet all such cases do not retrograde, and there are probably instances where the nervous system is more lightly attacked. In examining a country Board school with 502 pupils, my attention was directed to three boys, aged ten, eleven, and twelve years, who, though not imbecile, were very backward at their lessons, and in these I had no difficulty in recognising the marks of hereditary syphilis.

The following case was shown to me by Dr John Thomson, and I am indebted to this accomplished young physician for the description and portrait.

N. W., aged eight and a half years. Has three sisters and one brother, all of whom have presented distinct symptoms

* Especially Dr Judson S. Bury, 'On the Influence of Hereditary Syphilis in the Production of Idiocy or Dementia,' *Brain*, vol. vi, p. 44; and the papers of Doctors Shuttleworth and Beach in the *American Journal of Insanity*, January 1888.

of congenital syphilis. One of the sisters is suffering from progressive dementia.

As an infant N. W. was puny, and suffered from nasal obstruction, but had no distinct rash. When she was twelve months old she was found to be quite blind. About the same time she began to take fits, and these continued to recur till she was about six years old. When about five and a half, she began to walk for the first time, and two years later to speak a few words indistinctly.

When examined in February 1891 she was found small and weakly. She measured only 35½ inches in length, and her sister, who was two and a half years older, had larger hands and feet than she had. Her head looked rather large for her body, and her face had many of the characteristics of congenital syphilis. The forehead was prominent and bossy, the bridge of the nose was depressed, and there were slight fissures at the angles of the mouth.

Her eyesight seemed entirely gone, the left optic disc being quite atrophied, and showing traces of extensive choroiditis. In the right eye there was cataract. There was a divergent squint and constant nystagmus. Her hearing was very acute. Her teeth, though carious, showed no characteristic form. The child was able to run about, and when in her usual health kept herself clean.

She grimaced a good deal and chattered constantly, using disconnected words and repeating them over and over again. She was very fond of music, and tried to dance when she heard it.

Progress.—During the six years that had elapsed since her photograph was taken, she has very slowly got worse.

In May 1894 she began to have slight attacks, which consisted in a sudden jerking forward of the whole body, followed by a brief period of pallor and unconsciousness. In the following month she had a regular epileptiform fit.

PLATE XIV.

N. W., Portrait taken when she was between seven and eight years old.

Fits of one kind or another have continued ever since at more or less short intervals, and she has got gradually weaker. By January 1896 she was altogether confined to bed. In 1897 she only measured 38 inches in length.

Now (January 1898) she is extremely emaciated and lies in bed, constantly grinding her teeth and talking most unintelligibly. She often has twelve of the slighter form of fit in a day. Her mother, however, does not think that her mental condition is any worse than it was several years ago.

The principal lesions found after death were thickening of the cranial bones, periostitis, chronic meningitis, thickening and narrowing of the arteries of the brain, beginning usually as endoarteritis, retarding the movement of the blood in the vessels and causing atrophy of the nerve tissues. A scarcity of the nerve cells has especially been noted. Deprivation of the principal senses, through deafness and inflammation in the eyeball, sometimes adds to the mental failure. Dr Telford-Smith showed me a case of a lad who was deaf and the sight much obstructed by spots in the cornea, and who had other marks of luetic infection. In spite of these deprivations he was improving rather than falling back.

In the cases described by Dr Beach there were clear hereditary neuroses as well as venereal disease in the parents. He quotes Heubner's remark that hereditary disposition to nervous diseases appears to exert an influence in determining the syphilitic poison towards the nervous system. Dr Beach pertinently observes: 'Of course, constitutional syphilis can only lead to idiocy or imbecility by causing some disease of the skull, brain membranes, or arteries, or all of these combined, and so affecting the nutrition of the brain, and though *a priori* one would think idiocy should be a frequent result, yet practically it is not so. Exostosis of the skull, thickening of the brain membranes, and arteritis are not commonly found in idiocy, as far as my experience goes. I have never seen a

case of exostosis of the skull in this Asylum, although 1800 cases have passed through my hands, and have only found thickening of the membranes or arteries in seventeen cases post-mortem, and in only one of these cases was there a history of syphilis.'

The usual treatment of constitutional syphilis has been essayed in these cases, but with little effect.

CHAPTER XV.

CRETINISM.

Its Nature, Causes, and Diffusion.

THE literature of Cretinism is very extensive.* In the work of Saint-Lager there will be found a list of most of the older publications, in which the subject has been treated in a formal

* The following works on Cretinism are the principal authorities for the statements made in this chapter :—

Rapport de la Commission de S. M. le Roi de Sardaigne, pour étudier le Crétinisme. Turin, Imprimerie Royale, 1848.

Traité du Goître et du Crétinisme, par B. Nièpce. Paris, 1851.

Beobachtungen über den Cretinismus : Eine Zeitschrift herausgegeben von den Aerzten der Heilanstalt Mariaberg. Tubingen, 1850, 1851, and 1852.

Die Cretinen-Heilanstalt auf dem Abendberg, von Dr Guggenbühl. Bern und St Gallen, 1853.

Untersuchungen über die Entwickelung des Schädelgrundes im Gesunden und Krankhaften Zustande und über den Einfluss derselben auf Schädelform, Gesichtsbildung, und Gehirnbau, von Rudolf Virchow. Berlin, 1857.

See also *Gesammte Abhandlungen zur Wissenschaftlichen Medicin*, by the same author. Frankfort, 1856.

Études sur les Causes du Crétinisme et du Goître endémique, par le Dr J. Saint-Lager. Paris, 1867.

Deuxième Série d'Études sur les Causes du Crétinisme, par le Dr Saint-Lager. Lyons, 1868.

Enquête sur le Goître et le Crétinisme, rapport par le Docteur Baillarger. Paris, 1873.

Études sur le Goître et le Crétinisme, par Max Parchappe. *Documents mis en order et annotés*, par le Dr L. Lunier. Paris, 1874.

The investigations of Lombroso which I have used are mainly taken from the *Rivista Clinica di Bologna* (Fasc. 7, Luglio 1873, and Fasc. 11, Novembre 1873). See my Report in *Edinburgh Medical Journal* for August and September 1875.

Die Erkrankungen der Schilddrüse Myxödem und Cretinismus, von Professor Dr C. A. Ewald. Wien, 1896.

Beitrag zur speciellen Craniologie des Cretins, von Dr Ernst Jensch, *Allgemeine Zeitschrift für Psychiatrie*, Band liv, p. 776.

manner, which fills twenty-two pages, while in the exhaustive work of Dr Ewald the more recent literature fills a list of forty-four pages. Cretinism is an endemic disease, its areas being generally capable of clear definition. It has been common in the Alps since ancient times. Juvenal alludes to its frequency: Quis tumidum guttur miratur in Alpibus? Pliny and Strabo tell us that goitre was owing to the quality of the water used by the dwellers in the Alps. In these mountains in the centre of Europe it has attracted much attention and been the subject of diligent and persevering inquiry, both from many distinguished scientific and medical men, and from commissions appointed by the governments of Sardinia, France, Austria, and Switzerland.

According to Baillarger, in the department of the Hautes Alpes the number of cretins and idiots was 2747 to a population of 122,117, about 22 per 1000, the number of people with goitres being 111 per 1000. In Haute Savoie the number of cretins and idiots was 4346 to a population of 273,768, that is 16 in the 1000, the number of the goitrous being 134 per 1000. In the Arrondissements of Briançon and Embrun in the Hautes Alpes, the proportion of cretins is alone 35 per 1000.

In the Hautes Pyrénées the proportion of cretins is 6 per 1000; in the Ariège 4·5. The number of cretins and idiots in the whole of France is given as 122,776. These French statistics, collected by a commission appointed in 1861, but whose labours were not finished till 1870, are the latest and probably the most trustworthy. A few more figures may be added to show the frequency of cretinism on other aspects of the Alps. In Upper Austria, Saint-Lager says, there are 3703 cretins to 718,098 inhabitants, that is one cretin to every 191 of the population. The official statistics show that cretinism is very common in Styria, but they are known to be incomplete and to fall short of the true

numbers. About three years ago Dr Wagner * showed that out of 190,407 school-attending children there were known to be 3258 cretins, idiotic, and deaf children. In the district of Upper Styria there were 6·4 cretins to the 1000 inhabitants. In Carinthia, Saint-Lager tells us, there were 3068 cretins to 336,726 inhabitants, that is 1 to every 110. In the province of Aosta there were 2180 cretins and 3554 goitrous people, that is 27 cretins in the 1000. According to Parchappe, in the commune of Gignod in Aosta there were 268 cretins per 1000. Cretinism is met with in every quarter of the globe, amongst the Andes as well as in the Himalayas, in the Pyrenees, in Chinese Tartary, Sumatra and Java, in the isthmus of Darien, in the Rocky Mountains of North America, in Madagascar, and many other places. It is not confined to the valleys of mountainous countries, but occurs, though in less frequency, in the plains watered by the rivers which flow from the mountains where it prevails. Thus it is found along the upper course of the Danube and the Rhine, along the banks of the Lena; in Austria, Alsace, and the Black Forest of Baden, in the plains of Lombardy, and in parts of the Terai at the foot of the Himalayas; in the Delta of the Ganges, in the mud-flats of Assam, and in the plains about Multan, as in those of Chili and of Parana in the Argentine Republic. In the island of Niederwörth, near Coblentz, out of 750 inhabitants there were 131 cretins. A few cases of cretinism are met with in Derbyshire, Somersetshire, and the west of Yorkshire, accompanied, as usual, with a larger proportion of goitrous people. It is, however, most common in shut-up valleys, and has a close connection with goitre. Nowhere does cretinism occur where goitre is absent, but goitre may occur where cretinism is unknown or rare.

The geographical area of cretinism occurs within the wider

* 'Weitere Untersuchungen über den Cretinismus,' *Jahrbuch für Psychiatrie* xxii, 1.

area of goitre. It would appear that the cause which produces goitre alone when it is feeble, produces cretinism when it acts in greater intensity. Goitrous persons are of course not always cretins; nor does the size of the goitre indicate the degree of fatuity of the cretin. I might fill a hundred pages with discussing the various theories about the cause of goitre and cretinism; all of them have been proved to have too narrow a ground to rest upon.* The specific cause of goitre and cretinism is as yet only known by its effects upon the human body. The analogy between the malaria of paludal fevers and the cretino-genetic miasm is so striking that the knowledge that the microbe of intermittent fever has been discovered leads us to expect that a similar origin will be found for goitre and cretinism.

There are close valleys where more than half the children born become cretins. Guggenbühl speaks of a farm in Piedmont, where, for a hundred years, the children of healthy parents have always become cretins, and of another farm in the neighbourhood where two brothers had seventeen children who all became cretins. There are springs in Switzerland and Savoy which give a goitre to any one who drinks the water. At Cavacurti in Lombardy there is a spring to which

* We no longer need to waste a page combating the views of those who imagine that goitre and cretinism have only an accidental connection with one another. This received some countenance from statements in the Sardinian Report that there were 42 communes out of 261 where there was cretinism without goitre, statements quite at variance with the French inquiry of 1864, and with careful observers in Germany and Italy. In fact, many of the returns were made by persons who had no proper idea of what a cretin was. In the Alps we may be sure that most cases of sporadic idiocy will be returned as cretins. Saint-Lager quotes the following anecdote from a newspaper: 'The maire of a village got one day a table to fill up of the infirm persons in his commune. He filled up from memory the hunchbacks, cripples, blind, and insane persons, but stopped at the heading of cretins. The maire-adjoint and the secretary were consulted, but were both at a loss. A gendarme came in, whose opinion was asked. "No doubt it is a misprint," said that officer. "They want to know the number of Christians (Chrétiens) in the commune." This explanation being accepted, the maire wrote under the heading of cretins, "Nous le sommes tous" (We are all so).'

some of the young men go about the time of the conscription. Drinking the water gives them a goitre in a fortnight, which saves them from military service. There are two stations in Upper Assam where a three months' residence ensures a well-marked goitre. One might think that by using all the analytical means of science, by examining the geological formation, experimenting on the air and analysing the water, the stupefying poison might be found; but as yet it has eluded every search. The evidence is strong that the disease is conveyed through the drinking water; and, as Ewald observes, we are driven by the process of exclusion to the inference that the cause must be sought in the presence of a *contagium vivum*—an organic poison. With this view goitre-giving springs have been examined with careful search.

Klebs found in the Salzburg goitre springs an infusoria which he named Navicula, Bircher a diatom yclept Eucyonema. Lustig and Carle could not find Klebs' microbe in the springs at Aosta, but cultivated in gelatine some bacteria of their own finding under the suspicion that they were the agents in causing goitre and cretinism. Attempts to inoculate animals with it did not succeed.* Goitre appears in the domestic animals wherever it is endemic with the human species. In the department of the Isère and in Savoy hypertrophy of the thyroid gland is common with horses, mules, dogs, cats, cows, sheep, pigs, and goats. Mules are especially liable to be affected with goitre which appears associated with cretinism. Dogs and horses so affected become very indolent and lose their memories. Similar observations have been made in some parts of the Himalayas, in Kirensk in Siberia, and in Central America. It is evident that the specific cause of goitre and cretinism is helped by bad surroundings and poor living.

Parents leaving the valleys of the Aosta, or the Isère, or the

* *Annales Médico-Psychologiques*, 1887, tome sixième, p. 172.

Valais, for places where cretinism is unknown, leave behind them the danger of having cretin children. On the other hand, the intermarriage of goitrous parents, or where the man or woman is cretinous, as sometimes happens, increases the danger of cretinism in the children.* It has been known from time immemorial in the Valais, as well as the canton of Berne and elsewhere, that mothers who pass the last months of their pregnancy, and bring up their children for several years at high elevations, where cretinism is unknown, can thus save them from the disease. Many also send their children from the valleys to the higher grounds to be nursed. According to Baillarger this custom is still continued, and its efficacy has never been questioned. He gives an instance where a child born with a goitre, considered to be a mark of decided predisposition to cretinism, and whose father and mother were goitrous, was saved from cretinism by being brought up high on a mountain. Though he still has the goitre he became a distinguished magistrate. According to the Count Rambuteau,† Prefect of the Simplon in 1813, many children remain perfectly healthy for the first five or six months of their lives, frequently as long as three or four years, when suddenly symptoms of cretinism appear, and rapidly progress.

Forms of Cretinism.

The morbific cause of cretinism and goitre is believed to

* The general rule is that heredity only appears as an assistant and secondary cause of cretinism, but there are a few rare cases cited which seem to indicate that when the constitution of the parents has been deeply infected with goitre or cretinism they may beget goitrous or cretinous children, even after living some years in healthy localities. In all cases the tendency to goitre and cretinism disappears in a generation or two under the influence of a healthy climate, and also, as Baillarger remarks, of intermarriage with unaffected persons. See Baillarger, *op. cit.*, p. 298, and the note appended by Dr Lunier to Parchappe's work, p. 195.

† This valuable document, which Esquirol quoted from the MS., was published in the *Annales Médico-Psychologiques*, 1871.

exert its influence not only upon individuals here and there, but upon the whole population, or a great part of it, modifying the stature, the prevalence of crime, the voice and the hearing. Deafness prevails in the districts in which goitre and cretinism are rife. In Aosta there is a deaf-mute to every 197 of the inhabitants; in Sondrio one to every 345, while there is a cretin to every 132 of the population, and the number of deaths exceed those of the births (Lombroso).

Dr Meyer Ahrens* observes that everywhere, beside the more pronounced forms of cretinism, 'We find individuals who present only one of the signs of the malady; the intelligence alone, or the hearing and speech, are defective, or they have a goitre, or are simply ill-made or of cretinoid appearance. In short, we meet with a greater or lesser number of individuals with some of the less marked traits of cretinism. I class all these lesions together as inferior forms which, when fully developed, appear as cretinism. In the countries where cretinism, in the strict sense of the word, is endemic, we find localities where those inferior forms of cretinism appear—idiocy, deafness, and goitre. At the same time, in other countries or places where cretinism proper is readily met with, there are nevertheless in a certain number of persons, weakness of the intellect, deafness and goitre in an endemic form, and occurring in an unusually large proportion to the population. From this it clearly follows that if we cannot put within the domain of cretinism every deaf or goitrous person, every idiot and every little deformed man, nevertheless cretinism proper, together with the less marked forms, or different degrees, may in certain countries or localities arise from the same causes; hence we cannot separate these different forms without artificially dividing what in nature is one morbid family.'

* 'Aperçu de la Distribution géographique du Crétinisme dans la Suisse, 1853,' quoted in Parchappe, p. 35.

Symptoms.

Some children are cretins at birth. These have often a small goitre about the size of a nut. According to Dr Trombotto the born cretin has generally a large head, irregular in form. The fontanelles are larger than usual; the hair thick, and descending to meet the eyebrows, so that the forehead seems small. The eyes are dull and almost always half shut, and the eyelids, heavy and swollen, have only a few eyelashes. The skin is often livid during the first month, and then becomes yellow. The nose is flat, the mouth large; the tongue big and thick, and often protruded from the lips, which are large and flabby. Their cries are hoarse and unnatural, they take the breast in a sluggish manner, but never refuse it, and never appear satisfied. None of these symptoms are fixed, and infantile cretinism is seldom noticed before the sixth or seventh month. The children then, according to the authors of the Sardinian Report, present the following symtoms:—Sometimes the growth of the body makes very little progress. At other times, though apparently in good health, they are fat and puffed out and very weak. The colour of their skin is sometimes brown, sometimes an ashy yellow, sometimes natural. The head is constantly big; the fontanelles widely open; sometimes all the sutures disjointed as if by hydrocephalus. They seem to open their eyes with reluctance; their look is languid and stupid; their physiognomy remains always the same, unchanged by fear, joy, or impatience. They eat a great deal, and with eagerness; they pass the rest of their time in sleeping, and are not easily awakened. Their lips are thick and swollen, and generally remain gaping. Their nose is short and broad. They seldom weep, and their cry has something hollow and peculiar about it. The belly is swollen. The limbs are generally small and feeble, but sometimes quite normal. The neck is large and thick; in many

cases deformed with a goitre. As he gets older the apathy and general slowness of his growth becomes more manifest Teething, which always commences later, usually goes on for several years longer, and is often accompanied with an unpleasing salivation, and not unfrequently with alarming eclampsic fits. The teeth are generally irregular, distant from one another, crooked, or fixed in their sockets in a strange manner. They frequently blacken, decay, and fall out, often never to be renewed. The cretin can seldom hold himself upright before the second or third year, and cannot generally walk before the sixth or seventh. Speech comes later than walking.

Symptoms of cretinism, in most cases, appear before the fourth year, and rarely visit a child after it is seven years old; but Guggenbühl asserts that there are places where men have become cretins who came to live in them after being as old as forty years. Baillager,* too, tells us that, on an inquiry made by the Austrian Government in 1844, at Syrnitz, near Klagenfurt, it was stated, among other things, that the proprietor of the estate of Abbeck, which he had lately purchased, came to live there with his wife, who was in good health. She died goitrous and half a cretin, and the proprietor, with his second wife, have also passed into a state of demi-cretinism. The five children by the first wife are idiots. Their necks are thick and their bodies stiff. The children by the second wife—one of whom is two years old, the other one year—are still in good health, though likely to follow their elder brothers, who were also well in their first infancy.

In describing the appearance of cretins, authors have collected deformities from different cases, so as to make up the portrait of a monstrous creature rarely to be met with. The most characteristic traits which occur in cretins are the stupid, monotonous facial expression; the nose depressed at

* *Op. cit.*, pp. 32, 33.

its root and broad at the wings; the remarkable distance between the eyes, occupied by a hollow, from which the root of the nose seems to issue; the eyes dull and heavy, the broad zygomatic arch, the wide mouth, the broad lips, and the thick tongue. Virchow gives as a characteristic that the skin of the cretin is too large for the body, which it loosely covers. The teeth are generally bad, and soon come to decay; sometimes first teeth are not renewed. Cretins rarely attain the usual height. Many are dwarfs, no higher than three feet. The limbs are often disproportioned, the walk awkward—what is called the 'Bärengang,' or bear gait, in the German parts of Switzerland. The neck is generally short and thick, and from one-third to two-thirds of cretins are said to have goitre.

Fig. 8.
Female Cretin, aged 19. Valley of Aosta.

The portrait of the female is taken from a lithograph in the Sardinian Report. She was a 'demicretine' living in the valley of Aosta. She measured 39 inches in height, was a little deaf, and of sufficient intelligence to speak about her

wants and usual occupations. She never presented any signs of puberty.

Franz Nöth is copied from a beautiful lithograph in Dr Karl Stahl's Memoir. He says that it is the most distinct example of cretinism which he could find in his district. This boy's mother was subject to violent fits of passion. She had four children, three of whom were cretins. He was deaf and

Fig. 9.
Franz Nöth, Bavarian Cretin, aged 15.

dumb and very fatuous. Hands and feet constantly cold. 'Die Füsse sind Platfüsse, seine Genitalien sind sehr unentwickelt und unbehaart.'

These two portraits give what are called the typical traits of cretinism, but it would be a mistake to imagine that cretins have positive and easily detected characteristics, or that all or most of them can be included under a general description of their personal appearance. Some cretins are not different

from ordinary people in their looks, except perhaps by having a goitre. Though most of them are short of stature, often no higher than a metre, some of them are of the usual height, and a few are even taller. In the Sardinian Report two cretins are mentioned who were six feet high. Lombroso * has described a variety of cretins whom he terms Calibans, with small heads, stature above two metres (= 6 feet 6 inches), strong beard, and no anomalies in the bones and thyroid, which, however, were seen in their blood relations. They were active in their motions, and wild and unruly.

As examples, Lombroso gives a striking description of a family at Maleo, near the Adda; the father, a man of some property, left a record of a whimsical character and a small head; the mother was a very bad woman; she had a goitre and came of a goitrous stock; she had eight children, five of whom were idiots. The other three had goitres and were queer and malicious. They kept a café and cultivated some ground. John, the typical Caliban, was thirty-five years old when the Professor met him. He was 2·59 metres in height, that is, equal to 8 feet 6 inches, with a small head.

Measurements.

From glabella to occipital tuberosity	= 200 millimetres	= 7 in. 7 lines
Circumference	= 411 „	= 16 in. 2 lines
Transverse (coronal)	= 151 „	= 6 in.
At occipital region	= 200 „	

His furrowed face and prominent jaw-bones give him a base expression; he has a full beard, and is strong, though he has the slouching gait of a cretin. This gigantic idiot bolts daily twelve pounds of polenta, and would swallow more, though he has little sense of taste. His brother Augustin keeps him under through fear of the stick and hunger. John takes so much interest in his dismal occupation of a pall-bearer at funerals that he sometimes asks old people when

* *Klinische Beiträge zur Psychiatrie*, von Dr Cesar Lombroso, gesammelt und ans dem Italienischen übertragen von Dr M. O. Fraenkel, Leipzig, 1869, p. 136.

they are going to die, and sits at the gates of persons who are very ill. He frequents slaughter-houses, and would maltreat children and animals if he durst. Francis, his brother, is five years older. He is $2\frac{1}{2}$ metres high = 8 feet $2\frac{1}{2}$ inches; circumference of head 420 millimetres = $16\frac{1}{2}$ inches; his face reminds one of a frog. He hates his brother, though he shares his occupation. He is also malicious, and has more cunning. He is even suspected of having committed a murder. Rosa is as tall as her brother Francis, and has also a froggish face with a small head—circumference 450 millimetres = 17 inches 6 lines. She consumes about nine pounds of polenta in the day. Magdalen is much shorter, not being up to five feet. She is not so greedy of food as the others. She is affected with rickets and has a small goitre; she is given to mimicry, and chatters a little. Like the rest, she is very indolent. Circumference of head 40 centimetres, equal to 15 inches 6 lines. Columbine, another sister, is also a great eater, shuns everyone, and howls when people come near her. Has had epileptic fits since she was five years old, and has some marks of rickets. Peter, one of the brothers who is imbecile, is a shoemaker; he is a whimsical fellow and has a three-lobed goitre; he has a son eight years old who is also goitrous, and is stupid and dwarfish. Lombroso tells us that he found eleven such dreadful creatures in other parts of Lombardy, eight males and three females. The Professor thinks that in this remarkable family we may retrace the appearance of some of our primeval ancestors. In the great height of these creatures, in their voracity and stupidity, may we not find a confirmation of the ancient story of Jack the Giant Killer?

Professor Lombroso made a study of twenty-three cretins, fourteen of whom were alive, and nine dead. He gives two very careful tables of measurements, but it is much easier to record the figures than to generalise the results. In one case

we have a peculiarity, and in another the exaggeration of the very opposite tendency. Sometimes the head is of the normal size; sometimes it is larger than usual; at other times less. Deformities are very frequent; but they are of all kinds, so that one is inclined to believe that cretinism is owing to miasmatic intoxication during the fœtal state, which sometimes accelerates and sometimes retards the development of the organism. Nevertheless, Lombroso thinks that he can make out a ruling type, which has the following features: The weight is generally less than usual; the colour of the skin darker; the muscular force less; there is abundance of hair on the forehead; there is irregularity in the incisors and in the production and number of the teeth; the testicles are often wanting; the ears are longer; and the face smaller.'

Only in three cretins was there an approach to microcephaly.

Ferrus,* who studied thirty female cretins at Sion, in Switzerland, says they offered two types. The second type was distinguished by the length and slenderness of the body, the gracefulness of the limbs, the flexibility of the neck, and the angular form of the face, and so on; in fact, the very opposite of the first type, which was the orthodox pattern. When you come to two types your generalisation is cloven asunder.

The vital functions of cretins are languid. The pulse is generally a few beats quicker than normal, and the bodily temperature sometimes less by two or three degrees C. There is little variation in the cretin's appearance from childhood to puberty, or from puberty to old age. They are generally short-lived. I saw a cretin begging in the streets of Grenoble who had the appearance of being very old. He had grey hair, stooped much, and wanted all his teeth. He had a goitre of considerable size. A sou thrown on the pavement for him caused him to look round, but he failed to

* Baillarger, p. 41.

notice it, though it was lying before him. He did not answer me when I spoke to him, and allowed himself to be examined without remonstrance, as without interest. Nièpce has analysed the blood taken from eight cretins (only one of whom was in good health) and found that the fibrin and albumen were both less than in healthy blood.

Dr Erlenmeyer,* who made a careful analysis of the blood in thirteen imbeciles, principally cretins, states that the fibrin is the only component of the blood which occurs in pretty normal proportion, and does not vary notably in quantity from age, sex, or the time of taking food or fasting. Dr Erlenmeyer also found that much undigested and unabsorbed food appeared in the stools. The phosphatic materials of the food and the muscular fibres were not well absorbed; the starch did not duly pass into sugar; and neither it nor the fatty substances ingested seemed to be taken up in any normal proportion. With cretins, as with other idiots, puberty † is late, or does not appear at all.

* *Mikroscopisch-Chemische Untersuchungen des Bluts, Stuhls, und Harns Schwachsinniger Kinder*, von Dr Erlenmeyer, &c., *Beobachtungen über den Cretinismus*, Zweites Heft.

† The remarks of Nièpce on this subject are worth repeating: 'Mes observations m'ont appris que les fonctions de la génération sont nulles chez les crétins dont la maladie est très prononcée; que ce sentiment de la production ne se réveille qu' à mesure que le crétinisme diminue, qu' il est moins fort. Chez les cretins fortement affectés, les organes génitaux sont peu dévelopés et la verge, souvent à l'état rudimentaire, ne peut entrer en erection. A mesure que le crétinisme est moins prononcé, les parties génitales deviennent de plus en plus complètes, et l'on voit alors quelques-uns de ces malheureux posséder une véritable faculté reproductrice. La masturbation est assez rare, et si quelques exceptions ont été prises par certains observateurs pour l'habitude, c'est qu'ils ont vu quelques crétineux surexcités par une espèce de frénésie érotique, sans être retenus ni par la raison ni par la moralité, si livrer à la masturbation en présence le leur famille ou des étrangers. Toutefois, ces exemples sont fort rares, ainsi que j'ai pu m'en assurer par de nombreux renseignements. Les femmes crétines sont plus lascives; chez elles, les désirs venériens se font plus souvent sentir; elles sont reglées très tard, et cela seulement vers la dix-huitième ou vingtième année. Leurs règles reviennent à des époques d'autant plus fixes et regulières, que le crétinisme est plus faible.

'Lorsqu' une crétine est affectée à un haut degré, elle n' éprouve aucun désir vénérien.'—Nièpce, *op. cit.*, p. 85.

Sensory Deficiencies of Cretins.

All agree that the sense of sight is generally good. Guggenbühl says that deafness is rare with young cretins, but that dulness of hearing is not uncommon (Schwerhörigkeit nicht selten). Nièpce says that scarcely a third of these unfortunates enjoy perfect hearing. The external ear is ill-formed, and the auditory foramen is often very large and full of thickened wax. In some cases it was completely obliterated. He dissected the internal ear of a cretin, and found the internal auditory foramen much contracted, the ossicles large and of a spongy composition, and the substance of the auditory nerve denser than usual. The taste and smell of cretins, like those of other idiots, seem in many cases deficient, especially the taste ; and feeling, if not dull, is connected with many illusions, and requires special education. This is likely owing to the extreme mental stupidity, which is the saddest of all the deficiencies of these unfortunate creatures.

Mental Deficiency of Cretins.

There is every degree of obtuseness, from mere stolidity to complete fatuity. The Sardinian Commission has divided cretins into three classes, according to the measure of their mental powers.

In the first class the subjects have only vegetative faculties, are entirely destitute of reproductive and intellectual powers, and cannot speak. These are styled simply cretins.

In the second class they have vegetative and reproductive faculties and some rudiments of language. Their intellectual efforts go no further than their bodily wants, corresponding only to the impression of the senses. These are called semi-cretins.

The third class adds to the faculty of the preceding one a greater amount of intellectual power, without reaching the normal human capacity. They have some aptitude at learning a trade or doing different kinds of work. They are called cretineux, or cretinous.

Complications of Cretinism.

Cretins in general escape the ordinary diseases of childhood; but they are very liable to suffer from severe eclampsic fits, hydrocephalus, apoplexy, and other diseases of the nervous system, which complicate their disease and increase the mental obtuseness. Rickets is a common complication, generally appearing about the first dentition, and often ending in lameness and aggravation of the mental fatuity. Cretinism and albinoism occasionally go together. Cretinism is frequently found to co-exist with pellagra in the valley of the Po; and sometimes it blends its miasma with that of intermittent fever. Hernia is common with cretins. They are liable to be troubled by asthma; but phthisis is rare, though very often met with in genetous idiocy.

Diagnosis.

The diagnosis between these two forms must sometimes be difficult; and no doubt idiots of other classes appearing in the endemic haunts of cretinism are often put down as cretins; but we have no proof that the cretino-genetic miasma acts so as to exclude other causes which produce idiocy in countries where cretinism is unknown. As already noticed, genetous idiots have sometimes a cretinoid appearance; and the assertion of some French writers that the abnormalities in congenital idiocy are generally confined to the head is fallacious. The palate of the cretin is generally flat, and the

presence of a goitre would probably decide the class in an endemic district.

Prognosis.

One would think that the prognosis of cretinism was much better than that of other forms of idiocy, at least in early childhood, if the child could be withdrawn from the external cretinising influences and carried away to a healthy situation beyond the reach of the endemic cause. Guggenbühl, who established his Institution on an elevated site on the Abendberg, claimed to have made a number of total cures, and the improvement of his cases was attested by many competent authorities, some of which are cited in his work. I have, however, been assured by the teachers of several training schools visited by me in Switzerland, that cretins do not seem to improve under training any faster than idiots of other classes.

One very cheering fact is beyond dispute: both in France, Switzerland, and Germany a steady diminution in the prevalence of goitre and cretinism has been going on for at least thirty years. This is most probably owing to the increase in the well-being and comfort of the people who live in the endemic districts; for though easy circumstances and great attention to cleanliness and hygiene are not enough to save families from this dreadful visitation, they at least diminish the number of its victims. The cretino-genetic malaria, like that of paludal fever, visits with greater frequency those who live in wretched and unhealthy abodes, and through poverty, toil, or dissipation, have constitutions ready to yield to the inroads of disease.

Dr Ewald has even observed that cretinism has disappeared from some districts in Germany where the water supply remained unchanged. This he attributes to a general etterment in the condition of the people.

Pathological Anatomy.

In cretinism the morbid appearances are not only various, but they are often contradictory. The skull is generally about the average capacity, and smoothly rounded; as Malacarne observed, it is less arched on the summit and less plain on the sides than is usual. All the angles, processes, and ridges are effaced like a water-worn pebble. Sometimes it is small, and sometimes abnormally large. Frequently the bones of the cranium are thick and solid; but they have been observed to be very thin, or thick at one place and thin at another. The size of the orbits is occasionally unequal. The upper sutures are generally open, but sometimes closed; often there are Wormian bones between the sutures. As in genetous idiocy, the irregularities are greater at the base of the skull. There is often a want of symmetry between the right and left sides. The fossæ and sinuses are of different sizes, the processes run at different angles, or the foramina are of varying calibres. The foramen jugulare is in many cases broader on the right side, in a few broader on the left.

Virchow believed that he had found the capital abnormality of the cretin in the premature ossification of the spheno-basilar bone.

Virchow calls the basilar process of the occipital bone and the sphenoid the os tribasilare, because it is composed of three bones which represent the bodies of the last three cranial vertebræ. These are the—

I. Os basilare posterius, the basilar process of the occipital bone.

II. Os basilare medium, the posterior segment of the sphenoid bone. This includes the upper part of the clivus, the sella turcica, the great wings, the pterygoid processes, and the base of the rostrum.

III. The os basilare anterius, which comprises the jugum sphenoidale, the sulcus opticus, the smaller wings, the anterior clinoid processes, the ethmoid spine, and the rostrum.

The rest of the posterior parts are ossified first. The bodies of these bones grow long, as Virchow expresses it, from cartilage, and grow broad from periosteum. The two segments which compose the sphenoid commence to unite a little before birth. In the newly-born infant they generally appear united, because osseous union commences from above; but on making a vertical section of the bone, it is seen that the union has not gone far, the intervertebral cartilage being persistent for the greater part of the two segments of the bone. The disappearance of cartilaginous union goes on so slowly that traces of it may be found up to the thirteenth year. The dorsum ephippii and posterior clinoid processes forming the upper part of the clivus are still at birth composed of hyaline cartilage. The ossification of the rostrum is also slow, some of the cartilage being still to be found from the fourth to the sixth year. The basilar bone grows most from the seventh to the fifteenth year. About the period of puberty it unites with the sphenoid bone, and then the elongation of the base of the skull from the sphenoid to the occipital foramen comes to a stop, for the condyloid pieces of the occipital bone unite with the basilar and posterior portion about the sixth year.

Virchow affirms that after the cartilages have disappeared, and the three bones have become ossified into one, no elongation of the base of the skull can take place save by the dilatation of the cavity of the body of the sphenoid bone, which, however, appears to cause a certain amount of atrophy in the ethmoid bone. Virchow holds that this synostosis of the spheno-basilar bone takes place very early in cretins, which prevents the elongation of the base of the skull, and the growth of the brain, from the foramen magnum to the crista galli.

In a new-born cretin dissected by Virchow, the whole length of the base of the skull was found from 14 to 16 millimetres less than usual, and the angle between the posterior part of the sphenoid and basilar bone was from 42° to 46° more acute than normal. The synostosis of the sphenoid and basilar bone had already taken place.

Drs Eulenberg and Ferd. Marfels,* who made a careful examination of the body of a cretin woman, confirmed the views of Virchow.

Lombroso's measurements confirm the assertion of Virchow that the distance from the root of the nose to the occipital foramen is much shortened in cretins; but he found that in some cases there was no early ossification of the spheno-basilar suture. Similar observations were made by other pathologists. A curious contradiction of the theory of Virchow was observed in the skull of a cretin woman of twenty-eight years old. She had been married and had borne children. The skull was asymmetrical in shape (right parietal plagiocephaly); the sutures were not closed. The palate bones were flat, and the canines protruding. The basilar process and the occipital condyles were wanting, and their place was supplied by two plates of bone like the inferior articular processes of the atlas, but narrower, as it were traces of an atlas which had amalgamated with the occipital bone. Thus the first vertebra alone bounded the occipital foramen, which descended in a vertical direction. Only the upper part of the clivus remained, and it is clear there could be no ossification of the spheno-basilar bone when the basilar bone itself did not exist.

The sutures on the upper part of the skull generally remain open in cretins, allowing the hemispheres to increase to a normal size, and even on the floor of the cranium there are other sutures which remain open, and allow room for the

* *Zur Pathologischen Anatomie des Cretinismus;* Wetzlar, 1857.

growth of the base of the brain, both laterally and longitudinally.* Even admitting the abnormal shortness of this region of the skull, and a check in the corresponding part of the brain, what we know of the functions of this area does not warrant us in supposing that we have here an explanation of the fatuity of the cretin. The learned pathologist of Berlin thought proper to explain † that he did not hold the shortening of the base of the skull through premature ossification to be the exclusive characteristic of cretinism. The default of development in this region might also be shown by deficient growth of the bone. He considered the dwarfish stature of cretins and cretinoid persons to be another indication of scanty osseous growth. In a general dyscrasy like cretinism we should not be in a hurry to treat one structural deficiency as the cause of others. It appears that the bulldog shortness of the root of the nose is not always associated with shortening of the spheno-basilar bone. Certainly in viewing the bulging, especially in the parietal and frontal regions, noticeable in

* Dr Lucæ, in his *Architectur des Menschen Schädels*, Frankfurt am Main, 1857, p. 6, in opposition to the assertion of Virchow, points out that, independently of the spheno-basilar suture, the base of the skull can increase in length at the following edges: through the suture, between the frontal bones and the small wings of the sphenoid and the crista galli; through the points of meeting between the greater wings of the sphenoid and the temporal bones at their inner and outer ends; through the points of contact of the body of the sphenoid with the occipital bone; and through the points of contact of the sphenoid with the ends of the petrous portion of the temporal. The base of the skull can likewise increase in breadth, through the suture connecting the orbital part of the frontal with the ethmoid bone; through the middle points of contact of the great wing of the sphenoid with the temporal bones; through the sutures between the body of the sphenoid and the summit of the petrous portion of the temporal bone.

A rapid slope or other alteration in the clivus is common with genetous idiots. I hardly think it common with lunatics; in about fifty dissections of lunatics made with Dr F. Skae at the Stirling District Asylum, in only three cases was there any abnormality about the spheno-basilar bone. Dr F. K. Stahl, in his *Clivus Studien*, produces three or four cases out of 104 dissections where there were morbid changes about the clivus; but one of these was in an imbecile woman. See *Zeitschrift für Psychiatrie*, Band xxix, Heft 4; Berlin, 1872.

† *Virchow's Archiv*, Band xciv, p. 163; see also *Untersuchungen über die sogennante Fœtale Rachitis*, von Dr E. Kaufmann, Berlin, 1892, p. 27.

cretin skulls, one is easily led to view it as a process of compensation for the brain to accommodate its growth to the narrowness of the basal portion of its osseous case.

Many observers have noticed something abnormal about the basilar portion of the occipital bone. Ackermann * has described and figured in an engraving an unusual steepness of the basilar part of the clivus, which made it descend almost at a right angle to the sphenoid. Foderé † quotes the dissections of Malacarne to the same effect. Many other observers, however, have noticed that the basilar portion of the occipital bone is well-nigh horizontal, and the central furrow which receives the medulla oblongata wanting.

Lombroso tells us as the result of his dissections :—'The most constant characters, which only failed in two cases, were the horizontal position of the basilar process ; in four there is no occipito-basilar angle, but a straight line. This is the opposite to what we have in the negro, in whom the basilar bone slopes more than in the white man, and different from what we have in the anthropoid apes. The basilar process in its inferior and pharyngeal surface is concave in the cretin skulls. These are appearances which are only to be seen in the lowest species of monkeys and in quadrupeds. Finally, the hard palate is flattened, as in quadrupeds or in the fœtus of the fourth month.'

Amongst other peculiarities are asymmetry of the base of the skull, unequal size and strange shape of the foramen magnum and other exits and cranial nerves and vessels, shortness of the bones of the face, greater distance between the orbits, and scanty size of the under jaw.

The descriptions of the state of the brain are also often conflicting. Sometimes the brain is symmetrical ; more

* See Ackermann, *Über die Kretinen eine besondere Menschenabart in den Alpen*, Gotha, 1790, s. 33, 34.

† Foderé, *Traité du Goître et du Crétinisme*, Paris, an. viii, para lxxvi, p. 145.

seldom the reverse. The convolutions are frequently noticed to be simple, and sometimes to be flatter than usual. Nièpce observes that there is often abundance of serous fluid in the ventricles and under the arachnoid. The sensorium is bathed in a fluid which increases the obtuseness of the faculties and augments in quantity, till it infiltrates all the nervous substance, causing softening of the tissues. The presence of serous fluid is almost constant where the goitre is large and compresses the veins of the neck. Sometimes the sinuses are gorged with blood, and the membranes injected or adherent, or the cerebral substance hyperæmic; at other times the brain is anæmic. Sometimes the brain matter is hard in consistence; more rarely it is soft. In one case the grey matter is noted as abundant, in another as deficient in quantity.

The fissure of Sylvius has several times been noticed to be shallow and ill-defined. The corpus callosum has been found deficient in size, and in one instance to be larger than usual. The corpora quadrigemina, the corpora mammillaria, and other ganglia at the base of the brain, are found smaller or larger than usual, and of irregular shape. In a good many instances the cerebellum has been found small, asymmetrical, or irregular in form. Malacarne counted the lamellæ of the cerebellum, and found only 300 instead of 600; and this observation has been confirmed by subsequent anatomists. The medulla oblongata has been sometimes observed to be small; and Nièpce has described a good many irregularities in the roots and origins of the cerebro-spinal nerves. It is to be regretted that we have not got a good series of microscopic observations on endemic cretinism. Dr Stahl gives the details of a careful chemical analysis of the brain of a cretin; but nothing abnormal was found.

We thus see that the nervous centres of the cretin are in most cases diseased, and it is probably true that where the

fatuity is deepest the alterations are greater; but we can point to no special lesion or series of morbid changes. To use the words of Lombroso, the abnormalities observed point to a fœtal affection, which strikes one or other part of the embryo, now in this direction, and now in a contrary one.

It has been asserted that there are cretins who have no goitre, but such exceptions become rarer the more carefully the cases are examined. The importance of the thyroid disease in cretinism is now fully recognised.

The osseous growth is also affected in cretinism. The hollow lines of the extremities are short and thick, without fixed points of ossification, sometimes crooked, and to a superficial view bear a resemblance to the deformities of rickets.

Prophylaxis and Treatment.

In the Reports issued by the authority of the Committee of Public Hygiene of France, already so often cited, there are valuable recommendations for the prophylaxis and treatment of goitre and cretinism.

In Dr Baillarger's report the prophylaxis against the endemic diseases is reduced to the three following points:—

1. To combat the general causes of insalubrity, to improve the hygienic conditions, and increase the well-being of the population exposed.

2. To change the drinking water.

3. To institute everywhere a gratuitous course of treatment, which ought to commence with the appearance of goitre and cretinism.

Goitre being, as it were, the germ of the disease, ought to be treated at once. This would constitute a sort of individual prophylaxis, and might turn out a preventive in the families where goitre and cretinism are hereditary.

Experience on a great scale, in France, Switzerland, and

the Indian Terai, has shown that goitre may in most cases be successfully treated with small doses of iodine and iodide of potassium, with the external application of iodine and of biniodide of mercury. Parchappe and Baillarger recommend the use of minute doses of ioduretted salts, taken with the food, as a preventive. Boussingault observed that in the Andes the inhabitants of the valleys of the Guaca and Antigoia are exempt from goitre, though it is common all around, and that this exemption has been found associated with the use of salt containing a certain quantity of iodine. This salt is exported to other valleys to prevent or combat the endemic. As preventive and curative measures against cretinism, Baillarger recommends—

1. To withdraw the mothers who have previously had one or several cretin children from the action of the endemic causes during the time of pregnancy, by taking them to healthy places.

2. To send out to nurse on the mountains the children predisposed to cretinism, or who have shown the first symptoms of its appearance.

3. To erect in high and healthy situations especial establishments to receive the very young children, where they may be nursed and tended.

The treatment which Dr Guggenbühl found to be most useful at the Abendberg consisted of, in the first place, the vivifying effects of the free mountain air, on which he laid great stress. I have, however, been told by one of his assistants that the feebler children suffered much from cold in the winter at his elevated establishment. Milk, especially with the younger patients, was a prominent article in the dietary. He used cold and shower baths, with frictions of the skin with dry flannels, as well as with spirituous and aromatic fluids, to act upon the cold, flabby, and wrinkled skin of the cretin. For internal administration, Guggenbühl found the

preparations of iodine, theoretically so promising, not to do any good. They increased the weakness, and might, he thought, be dangerous by causing atrophy; but the combination of iodine and iron in the form of the syrup he found to be of value. Where anæmia was a prominent symptom, he used carbonate of iron. Cod-liver oil was indicated where there was much muscular weakness, and proved useful to raise the tone of nutrition and physical strength. He found benefit from the salts of copper, as well as from the oxide of zinc and valerianate of zinc, when there was spasmodic complication. Where there was a wasting of the limbs from rickets he used magneto-electric currents, either by applying the electrodes directly to the parts or by passing the current through tepid water in which the patient was immersed. Dr Elliotson, who came to visit him, tried mesmerism, but did not succeed with any of his manipulations in sending a single cretin to sleep.

The light thrown by the new observations and experiments upon the function of the thyroid gland shows a hopeful vista for the treatment of cretinism. This will be considered in the following section.

CRETINOID IDIOCY OR SPORADIC CRETINISM.

(*Idiotie pachydermique.*)

It looks now like a strange blindness that physicians were so long in seeing that the common cause of cretinism, of cretinoid idiocy or sporadic cretinism, and of myxœdema, lay in the deficiency or affection of the thyroid gland. But pathologists were prevented from more speedily discerning this relation by confident statements that in some cases, both of endemic and of sporadic cretinism, there was no affection of the thyroid, though a more rigid scrutiny of cretins always tended to reduce the number of such apparent

exemptions, and to show that nearly all cretins had a goitre, large or small. In like manner it has been stated that there are cases of cretinoid idiocy where the thyroid seems to be normal, but analogy would lead us to the belief that a closer examination would detect degeneration of the gland. Cretinoid or pachydermic idiocy appears to be a congenital or infantile form of myxœdema, as idiocy of other kinds is a congenital or infantile form of dementia.

The degeneration sometimes, though rarely, affects the embryo. The infant comes into the world still-born, stunted, with the loose skin, fatty tumours in the neck, and the thyroid gland wanting. In most cases the child seems at first to be normal, or nothing unusual is noticed save a large tongue or apathetic dulness, and the symptoms come on at the end of the second to the fifth year. When they affect the adult they must take a modified form, since the growth being completed can no longer be checked.

Scattered specimens of this rare variety have been found and described all over Europe and North America, in the country and in towns.

Though the causes of sporadic cretinism are obscure, the symptoms are very definite and characteristic. These cretinoid idiots are generally short of stature, sometimes mere dwarfs. Their growth seems to go on very slowly, or to cease years before the normal time. The figure is broad and squat; the limbs short and thick; the hands and feet stumpy. The temperature is below the normal. When well-fed and cared for they often become very stout, and weigh enormously heavy. The complexion is dusky; the skin baggy-looking, as if too large for the body. The surface is wrinkled and sometimes scaly. The head is generally rather small and flattened at the top; the hair commonly sparse. The nose is broad and flat, the nostrils extended. The low bridge of the nose renders more

apparent the distance between the eyes, which are partly closed by the swelling of the lids. The lips are thick; the tongue is often too large for the mouth, which is kept open. The development of the first teeth is tardy, and the second teeth are very late in coming; the milk teeth persist longer than is customary with ordinary children. In most cases the thyroid gland is totally wanting, and there are irregular deposits of fat in the posterior portions of the neck, which are sometimes so large as to form a little hump on either side. In wasting diseases these fatty enlargements disappear. The spine is often bent. The belly is protuberant; umbilical hernia is common. The genitals are poorly developed; the testicles small and late of descending. With females the breasts are small; the uterus and ovaries are often rudimentary; menstruation, if at all, is late. Sexual feeling seems absent. The sensibility of the skin and electrical excitability appear to be about normal.

These idiots are generally placid and good-tempered, slow of walking and of speech, very deficient in intelligence, but orderly and obedient. They have a dim appreciation of fun, but rarely cry, and never shed tears. Dr Fletcher Beach allowed me to examine several of these children at the Clapton Asylum for the pauper idiots of London. He also showed me the dissection of one child who had died at the time.

The child whose portrait is given, by the kind permission of Dr Fletcher Beach,* was fifteen years of age. She was

* The first descriptions of this peculiar form of idiocy were given by Dr Hilton Fagge in the *Medico-Chirurgical Transactions*, London, 1871, and in the *Transactions of the Pathological Society of London*, vol. xxvii, London, 1874, and by Fletcher Beach, M.B., in the same volume; also by him in the *Transactions* for 1876. The child whose portrait is reproduced is minutely described in the *Journal of Mental Science* for July 1876.

Since then a large number of treatises and articles on the subject have appeared. Most of them are referred to in Dr Ewald's *Erkrankungen der Schilddrüse*, and an elaborate paper by Dr Andrea Cristiani, 'Tiroide e Cretinismo,' in *Annali di Freniatria*, Novembre 1897.

38 inches in height, and weighed 3 stones 3 lbs. She was very fat; the head was flat at the top, and spreading out at sides, measuring 11 inches longitudinally, 10 inches transversely, and 19 inches in circumference. The teeth were regular and in good condition.

Fig. 10.
Cretinoid Idiot.

She was of a very cheerful disposition, and though she did not say much, she would show by her manner her appreciation of any amusement that was going on. She went to school in the Asylum, and could say her alphabet, spell a few words of three letters, and write from dictation two letters. She could add to 5, count to 50, multiply by 2 up to 12, and could distinguish three colours. She could hem a little. From this it will be seen that she had a certain amount of intelligence. She was cleanly in her habits; her appetite was good, and she slept well. She had menstruated two or three times.

In 1883 it was found by Professor Kocher of Berne that after removal by operation of the whole goitrous thyroid gland, many of the patients fell into a state of torpor and debility, with great sensibility to cold, and slowly dwined away. Lanceraux removed the thyroid for goitre in a boy of eleven years of age. Well grown up to this time, his whole physical development was arrested, so that five years after the operation he remained the same size which he had been at the time of the operation. Similar results were found by Horsley and others to follow the removal of the thyroid gland in animals, especially dogs and monkeys. In the latter the swelling of the eyelids, lips, and skin was apparent. The hair was observed to become coarse and rough, the skin scurfy; the pulse became slower and the temperature less. The animals became languid, stupid, and apathetic; the muscles weak and spastic; there were observed in some cases, paræsthesia and analgesia, with a tendency to convulsions. In young animals the development was arrested, the bones ceased to grow, especially in length.* In sheep and goats the horns were atrophied, the hoofs small. The genitals, both in the male and female animal, were found to be smaller than usual, and the spermatozoa few in number and wanting in mobility. After death the cells in the cerebrum and cerebellum, as well as in the nuclei of origin of the vagus and facial nerves, were found to be swollen, turbid, and granular, sometimes vacuolated or atrophied; the vessels were thickened and degenerated.

Diagnosis.

Endemic cretinism and pachydermic idiocy, being both dependent upon injured or lost function of the thyroid gland, go under the common heading of Athyreoidea, but though

* Cristiani, *op. cit.*, p. 364.

they resemble one another, they are not to be treated as the same malady. The first has a local cause, which distinguishes it as epidemic cholera is distinguished from cholera nostras. Then in cretinism there is a tendency to premature ossification, especially of the basal cranial bones, while in the pachydermic cachexy we have a delay of ossification, with a tendency to open fontanelles and sutures long of closing. In pachydermic idiocy the symptoms are more decided and the appearance more distinctive. In the cretin the hands are of a more normal shape, whereas in the pachydermic idiot the fingers are lumpy and the hands swollen. In cretinism the thyroid is affected with hyperplasia, cystic or fibrinous degeneration, but more or less of the normal tissue remains, whereas in most cases of the pachydermic form the gland is wholly wanting. Idiots of other classes appearing in the endemic haunts of cretinism are likely to be put down as cretins; but we have no proof that the cretino-genetic miasma acts so as to exclude other causes potential to produce idiocy. As already noticed, genetous idiots have sometimes a cretinoid appearance. The palate of the cretin is generally flat, and the presence of a goitre would decide the class. The cretin has often wasting of the muscles, especially of the extensors, and has a slanting gait. In general he is more passive and less mobile than the genetous idiot; he has often a yellow complexion, whereas that of most other idiots is pale, and sometimes normal.

Treatment.

The great importance of the thyroid being thus evident, Schiff tried transplantation of the gland from another animal, in hopes that this would supply the lost function; but his operations on dogs were rarely successful, and even when the thyroid was implanted on its new site it soon began to

degenerate. More encouraging results followed the injection of the thyroid juice under the skin; but when it was discovered that the same effects followed the swallowing of the raw gland, the difficulties of administration were over. The results of this treatment upon children affected with pachydermic idiocy are so rapid and striking that they rather resemble the transformation in a fairy tale than the slow gains of the healing art against chronic disease. The loose, flabby skin tightens; the fatty swellings disappear; the tumid belly planes down; the umbilical hernia retires; the puffiness in the limbs and body passes away. The eyes widen; the lips become thinner; the tongue is no longer kept out, the chin emerges, and a natural complexion and shape replace the gross caricature of the human figure. While the patient becomes lighter he begins to grow taller, even if there has been no increase in stature for years. The coarse, scanty hair is replaced by a finer and softer growth; the second teeth show themselves, and replace the old black stumps of the first dentition. Dwarfs of twenty years old begin to grow and to get their second teeth. At the same time they become quicker in action, brighter, and more intelligent.

Overdoses of this powerful remedy have been followed by very rapid pulse, feverishness, diarrhœa, faintness, and even fatal collapse; in other cases, especially in ordinary health, whole glands have been taken without a sensible effect. One ought to begin with a small dose, $\frac{1}{8}$th of the average gland in the sheep, or 1 gramme by weight, or one of the tabloids, equal to 5 grains, given twice a week, and then slowly increase the amount, watching the pulse and temperature.* When the

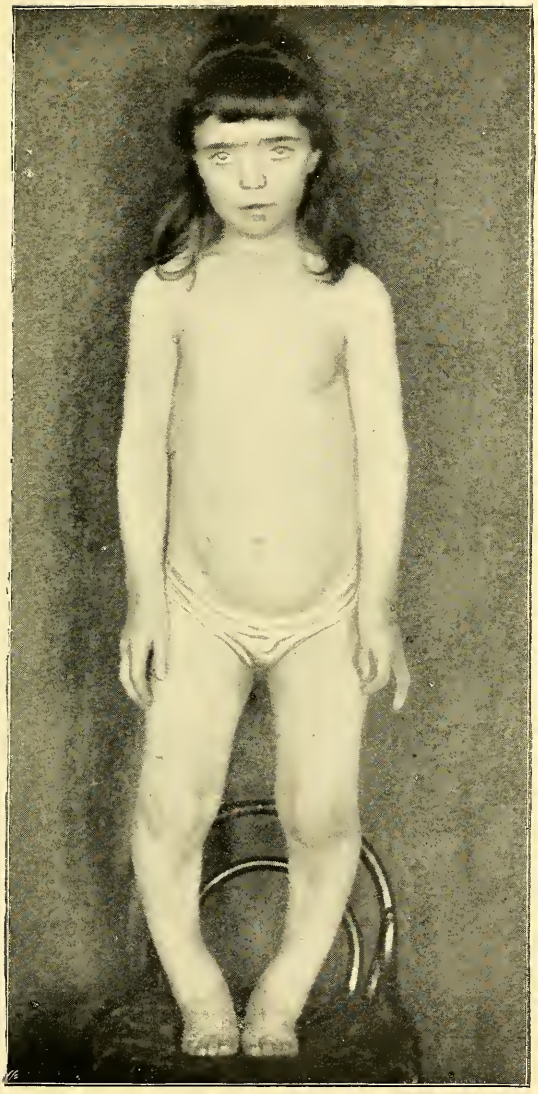
* Baumann discovered the presence of iodine in the form of an organic compound supposed to be the active principle of the thyroid gland. Triturated with sugar of milk it forms iodothyrine. This preparation, now used in Germany, contains 0·0003 gramme = $\frac{1}{2000}$ grain of iodine. One gramme of iodothyrine is equal to one gramme of the fresh thyroid of the sheep.

patient begins to grow taller there is a danger of bow legs, as the cartilage of the long bones grows quicker than the ossifying deposits of lime. Increased lateral curvature has also been observed. As the children, improving in strength and vigour, are inclined to move more about, this tendency to bending of the bones should be borne in mind.

The following figures are taken from engravings published in the *Lancet* of October 2, 1897, to illustrate a paper by Dr T. Telford-Smith. In the same number there is also an able contribution on sporadic cretinism, with nine figures illustrating the thyroid treatment, by Dr A. Gordon Paterson. Though the disease is a rare one, so many cases have been recorded in our wide and active medical literature that we are enabled to generalise the result with some surety. Naturally the successful cases come more to the front, but there are very few in which there has been no improvement. Dr John Thomson has treated a considerable number of cases of infantile and adult myxœdema, and has most kindly afforded me opportunities of seeing them. In the interesting discussion at the annual meeting of the Medical Association at Carlisle in 1896, Dr Thomson said: 'This latent capability of reacting to thyroid treatment by a renewed growth and development seems to be present in all cretins, but its degree varies enormously, and is apparently in direct proportion to the youth of the patient when the treatment is first begun. It is very strong in children, less so in adolescents, and comparatively slight in those who have reached adult age.' One girl, five years old, who was seven inches below the average height of children at her age, grew five inches six lines the first year, four and a half inches the second year, and two and a half the third year. Since she has approached the normal height, this girl grew at a slower rate.

Dr Thomson also observed, that 'when a normal child gets taller we find that the lower limbs grow considerably faster

The patient at the age of fifteen and a half years (before treatment).
Height, 3 ft. 6 in.; weight, 4 st. 2 lb.



The patient at the age of seventeen years and nine months (after two and a quarter years' thyroid treatment). Height, 4 ft. 1½ in.; weight, 4 st. 10½ lb. Showing increased bowing of legs and enlargement of knees and ankles.

PLATE XVII

PLATE XVIII

A. C., aged 1 years and [illegible] months, after three months of thyroid
treatment, March 7, 1901. Height, 35½ inches

PLATE XIX

A. C., aged 10 years on [illegible]
July [illegible], 1903. Height, [illegible] inches

PLATE XX

A. C. aged 11 years and 8 months after [illegible]
December 31, 1904. Height [illegible]

than the trunk and upper limbs do, and consequently that the centre of the body changes from the umbilicus in infancy to the pubes in adult life. Now the young cretin grew normally in this particular. In the adolescents the growth of the upper and lower limbs was very nearly the same, while in the two adults the arms grew more than the legs.'

It has been a disappointment to our warm hopes that under the thyroid treatment the mental improvement has not kept pace with the bodily growth, though almost all the patients have shown a quickening in intelligence and a greater readiness to react to impressions. Naturally the improvement has been greater the earlier the age at which they have been treated. In the case of the girl already mentioned, who grew above five inches in a year, the gain in intelligence was so great that it looked as if she had been rescued from idiocy. She went to a board school, and her teachers reported that when she was eight years old, except in arithmetic, she was not far behind the average of the class, and was certainly a good deal more intelligent than some of the other children.* In general no very distinct mental progress is perceptible before the sixth month after the commencement of the treatment, but sometimes a change in the intelligence is almost immediate.

Against endemic cretinism we may fairly hold it as a prime indication to treat the hypertrophied thyroid. In Switzerland the raw gland of the sheep or the extract has

* About this girl her teacher gives a report, dated 7th March 1898 : 'For the past year her progress has been in all subjects except arithmetic rather above the normal.

'She reads beautifully, is excellent in memory work, and writes fairly well. Considering the time she has been in school, October 1894 to March 1898, I should say that she is now rather less than a year behind the average pupil.

'In arithmetic she makes little advance. She can write down numbers up to 1000, can add four memory doubles, such as 5 + 5, 8 + 8, etc., and now and again can add and subtract units. She has at present very little idea of abstract numbers ; but on the ball frame can add and subtract fairly well, provided she is allowed to proceed by units.'

been used for goitre, and with success, especially in children. It has been found to effect a reduction in the swelling in the hyperplastic forms; against the colloid, cystic, and fibrous forms it seemed to have little power. One might fairly expect that much could be done against cretinism through this medication, and this would be best done in a separate hospital under a resident physician, for attempts should be made at the same time to stimulate brain action. Perhaps some way has been already made in this direction; but as far as my information goes, the endemic form of cretinism has not been found so amenable to treatment as the pachydermic form.*

Those who have seen a number of idiots must have observed the frequency of cretinoid characteristics, especially in the genetous forms. The stature is often short; there is a distance between the two eyes, and a broadness of the features. It is still an important question to investigate whether a deficiency or degeneration of the thyroid gland occur in such cases, and whether the treatment by injection or feeding will be beneficial. I gave the raw thyroid in jam for a year to a young Mongolian idiot under my care. There was a considerable improvement in his growth and intelligence, but as other methods of treatment were used at the same time, it is difficult to say how much benefit came from the gland. The dryness of the skin passed away, and this could be fairly attributed to the new medication. Dr Telford-Smith tried it on a larger scale, and reported some improvement; but as far as I can learn there has been little benefit attending the use of the thyroid in Mongolian idiocy.

* Dr Rushton Parker of Kendal published a case of endemic cretinism, the mother goitrous, in the Lake District of Cumberland. The patient had all the characteristics of sporadic cretinism, and had a goitre along with lipomatous swellings, which is very unusual. Although she was eighteen years old before the thyroid treatment was used, she made considerable improvement, both physical and mental. She grew 3½ inches in six months.—*British Medical Journal*, June 27, 1896.

Pathology.

After reviewing all these clinical observations and experiments concerning the thyroid, I have reached the conclusion that this gland secretes and pours something into the blood which has a powerful effect upon the nutrition and function of the brain and of the whole organism. It has for years seemed to me that there is too much solidism in our pathology, and that the vital powers of the blood have been too much overlooked.

The blood is not only the nourishing fluid, the plasma from which the whole frame is built up and sustained, but it is the active power in stimulating the function of the organs of the body. As I have before observed,* 'Unless arterial blood circulate in the brain, mental activity ceases. Not only is the blood needful for repairing the waste of tissue which follows cerebral activity, but arterial blood seems to be a necessary factor along with the nervous tissue in all manifestations of cerebral activity. The blood stands to the brain action as the acid does to the zinc and copper plates in a galvanic pile.'

Homer, in the *Odyssey*, shows how with deep poetic insight he knew of the life-giving powers of the blood. When the wandering Odysseus visits the shores of Hades he digs a trench, slays some sheep and fills it with their blood; the shades of the dead gather around the steaming trench, and are only kept back by the hero's waving sword. When they are allowed to drink the warm blood their memory returns. Even Antikleia, the mother of Odysseus, does not know her son till she drinks the blood.

From an examination of the blood in two pachydermic idiots aged four and five years, M. H. Vaquez † found

* *The Blot upon the Brain: Studies in History and Psychology*, p. 321.

† *Recherches Cliniques et Thérapeutique*, par Bourneville, vol. xvii, 1897, p. 179.

nucleated red globules. M. Hayem observed that these nucleated globules are more frequent in the blood the younger the child. M. Vaquez confirmed the observation of Kraepelin that the diameter of the ordinary red globule is unusually large in myxœdema = 8 μ 24.

He found the hæmoglobin and the number of red globules were less than usual. After treatment with the thyroid the nucleated red globules were no longer seen, the diameter of the red globules diminished to 7 μ 90, and the relative number of the red globules and the amount of the hæmoglobin slowly increased.

We have a report of the autopsy of the girl whose portrait is given at p. 240, Fig. 10.

On removing the brain the foramen magnum was found to be smaller than normal, and on each side, near its margin, was an elevated rim, the space inclosed being triangular in shape. The clivus was very steep; the spheno-basilar suture was still connected with cartilage. The brain weighed 34 oz.; the convolutions were distinct and coarse, measuring half-an-inch in width. A microscopical examination of a convolution was made, but no general wasting nor signs of inflammatory change were found. In this, as well as in another case examined by Dr Savage, the vessels were tortuous, and the cortical layer was thicker than usual. There was no trace of a thyroid gland, but the two fatty tumours were found in the usual situation, not defined or encapsuled, but sending out processes under the sterno-mastoids and clavicles.

Some of the brains of these cretinoid idiots which have been examined appear to be healthy to the naked eye. Bourneville and Bricon made a careful study of a pachydermic idiot, twenty-four years of age. The convolutions were small and the fissures irregular. There was no trace of the thyroid gland, but the pituitary body was enlarged, otherwise nothing abnormal.

In two cases where a microscopical examination was made by Dr Fletcher Beach, few of the nerve cells of the brain were found to have processes, and these were small and stunted. The nerve cells themselves were generally rounded, and the nuclei usually situated in the centre with a space around.

Professor Greenfield stated that he had carefully examined the brain in a case of myxœdema, but could detect no morbid change, although he found traces of chronic neuritis in the peripheral nerves, which may perhaps be accounted for by the degenerative changes in the skin.

Some of the brains of cretinoid idiots which have been examined appeared to be healthy to the naked eye.

Some further microscopic studies of the nervous centres in this form of idiocy are much to be desired.

Postscript.—Since this chapter was written, Dr H. Munk (*Virchow's Archiv für Pathol. Anatomie*, Band cl; see also *Neurologisches Centralblatt*, 1898, Nr. 6) has thrown down the gauntlet to the many physiologists and physicians who have become converts to the 'Thyroid Fanaticism.' He claims to have proved by numerous experiments that this organ is not of importance to life, and that the belief that the loss of its function, after its removal, can be repaired by transplantation or administration of the glands is unfounded. He states that of the animals from which the gland was removed, but 50 per cent. of the monkeys and rabbits, and 25 per cent. of the dogs and cats, showed symptoms of illness: apparently these symptoms were 'tremors, with paroxysms.' Only in monkeys did he see anything like myxœdema after removal of the thyroid, nor did these animals seem weaker in intelligence. I am sorry to leave this subject under a controversy; but it would not be proper to pass over the experiments of so distinguished a physiologist as Dr Munk.

CHAPTER XVI.

IDIOCY BY DEPRIVATION.

Its Nature.

IDIOCY by deprivation means that condition of mind in which a child remains who is deprived of two or more of the principal senses—such as sight and hearing. This condition, if it be not idiocy, simulates it so closely, that it is needful to say a few words about it. As is finely stated in the aphorism quoted by Sir William Hamilton, 'Cognitio omnis a mente primam originem, a sensibus exordium habet primum.'

A being deprived of sight and hearing, the two senses most useful in perception, is, even when in possession of a potential intellect of good capacity, in reality an idiot as far as its relations with the outer world go. It is a mere recipient of sensations, from which it cannot, without some very special culture, deduce sufficient explanations of the phenomena of the outer world for it to act like a reasonable being. Idiocy by deprivation is like a seed which does not sprout because it is kept away from sunlight and moisture, while incurable idiocy is like a seed in which the germinal faculty has been destroyed; and the higher grades of idiocy resemble seeds in which the germinal capacity is much impaired and the growth enfeebled, so that they require unusual stimulants. I have met with several cases of idiots who were deaf; with others who were blind, or nearly so;

and either of these deficiencies, of course, when combined with mental torpor, is a very serious bar to instruction. In a child of ordinary capacity, deafness is a much greater obstacle to instruction than blindness; but it may admit of some doubt whether this is the case with idiots, at least with idiots of the lower grade, where the power of seizing abstract ideas is deficient, and who often are unable to learn more of the outward world than is gained from observing its superficial phenomena. In one case already referred to, a boy, who was sinking into an extremely obtuse condition from having become deaf and dim of sight, had his mental powers and faculty of expression aroused by being taught figurative signs, and to spell on his fingers.

Helvetius argued that the great cause of the superiority of man, and of one animal over another, lay in the tactile and prehensile power of the hands or other organs. The fallacy of such notions was ingeniously shown by Frederick Cuvier, who pointed out that the seal was an animal of wonderful sagacity, though unusually deficient in organs fitted for feeling or grasping.

About a score of unfortunate creatures who have lost the sense of sight and hearing have been described in different scientific journals. In the census of Great Britain for 1871 there were 111 returns for blind deaf-mutes, and in the census of the United States of 1880 there were returned 256 blind deaf-mutes, 217 blind deaf-mutes also idiotic, and thirty blind deaf-mutes who were also insane. No doubt many of the second class belonged to the idiocy of deprivation.

Illustrative Cases.

Very instructive cases are those where a human being suffering from deprivation of two or three senses has one of them suddenly restored. A well-known instance of this

kind was James Mitchell, who was born deaf and blind, but who suddenly gained his eyesight on being couched for cataract.*

Laura Bridgman.

The famous case of Laura Bridgman, as well as that of Meystre, and some others less known, are memorable examples of what a very skilful and patient education may do in awakening the dormant activity of the mind when the principal channels of sense are cut off. Many accounts of Laura Bridgman have been published,† and the late Dr Howe of Boston has left a sketch of the system of education which he pursued with this interesting creature in the Forty-Third Annual Report of the Perkins Institution and Massachusetts Asylum for the Blind. As this document is not for sale, and as Dr Howe's remarks are of much psychological interest, though the same method could not be applied to children of deficient mental capacity, the following quotations are given :—

'I found in a little village in the mountains a pretty and lively girl about six years old, who was totally blind and deaf, and who had only a very indistinct sense of smell—so indistinct that, unlike other young deaf-mutes, who are continually smelling at things, she did not smell even at her food. This sense afterwards developed itself a little, but was never much used or relied upon by her. She lost her senses by scarlet fever so early that she has no recollection of any exercise of them.' ‡

* See an account of these cases in the work *On Aural Surgery*, by William R. Wilde, already quoted, pp. 476-480 ; also, *The Lost Senses*, by Dr Kitto.

† There is a good *Life of Laura Bridgman* by M. S. Lamson, Boston, 1878.

‡ Dr Donaldson tells us that Laura was two years old when she was attacked by scarlet fever. 'Both eyes and both ears suppurated, and taste and smell were impaired. Sight in the left eye was entirely abolished. With the right eye she

Dr Howe then tells how he took her into his house at Boston and set about trying to educate her. 'I required her by signs, which she soon came to understand, to devote several hours a day to learning to use her hands, and to acquiring command of her muscles and limbs. But my principal aim and hope was to enable her to recognise the twenty-six signs which represent the letters of the alphabet. She submitted to the process patiently, though without understanding its purpose. I will here give a rough sketch of the means which I contrived for her mental development. I first selected short monosyllables, so that the sign which she was to learn might be as simple as possible. I placed

appeared to get some sensation from extremely large bright objects up to her eighth year, but after that time became completely blind. Two years passed before she recovered sufficiently to sit up all day. At the age of five years she had regained her strength.' By means of tactual signs of the simplest sort she was taught to sew, to knit, and to braid, and to perform some little household duties. When she was brought to the Perkins Institution under the care of Dr Howe she was seven years and ten months of age. Her regular education lasted till she was twenty years of age. The sense of taste alone was well enough preserved to give her material aid toward knowing the external world, but her discrimination of two compass points was twice or three times as acute as that of a seeing person.

It should be borne in mind that in retaining cutaneous sensation, Laura still had the most important of all the senses. Feeling, which renders us aware of all outward changes affecting the surface of the body and of the cavities of the mouth and nostrils, is the first of the senses developed, and the most indispensable of all. It seems necessary for the formation of our idea of space and of an outer world, and even for the conception of our own personality. From the multiform impressions which this sense gives of the position of our bodies the waking condition is sustained. Observations by Strümpell, Ballet, Pick, and others go to show that in some rare cases persons deprived, to a greater or less extent, of cutaneous sensibility at once fall into an unconscious or somnolent state, when impressions from the remaining senses are cut off, by shutting the eyes or stopping the ears. In a patient of Sir T. Grainger Stewart, whom he kindly showed to me, there was loss of the sense of smell and the sight of the left eye through basal meningitis, there were traces of paralysis of one leg, but no general anæsthesia. Her hearing was good, and her intelligence did not seem to have suffered; but on closing the seeing eye, or on interposing some object between the eye and the light, she promptly fell into a condition of unconsciousness, which was ushered in by a loud snoring, and passed away in less than a minute with a blowing through the half-closed lips. On this curious subject see my German Retrospects in the *Journal of Mental Science* for January 1893, p. 129, and April 1896, p. 411.

before her, on the table, a pen and a pin, and then, making her take notice of the fingers of one of my hands, I placed them in the three positions used as signs of the manual alphabet of deaf-mutes for the letters *p e n*, and made her feel them, over and over again, many times, so that they might be associated together in her mind. I did the same with the pin, and repeated it scores of times. She at last perceived that the signs were complex, and that the middle sign of the one, that is, the *e*, differed from the middle sign of the other, that is, *i*. This was the first step gained. This process was repeated over and over hundreds of times, until, finally, the association was established in her mind between the sign composed of three signs, and expressed by three positions of my fingers, and the article itself, so that when I held up the pen to her she would herself make the complex sign; and when I made the complex sign on my fingers, she would triumphantly pick up the pen and hold it up before me, as much as to say, "That is what you want."

'Then the same process was gone over with the pin, until the association in her mind was intimate and complete between the two articles and the complex positions of the fingers. She had thus learned two arbitrary signs, or the names of the two different things. She seemed conscious of having understood and done what I wanted, for she smiled, while I exclaimed inwardly and triumphantly, "εὕρηκα! εὕρηκα!" I now felt that the first step had been taken successfully, and that this was the only really difficult one, because, by continuing the same process by which she had become enabled to distinguish two articles by two arbitrary signs, she could go on and learn to express in signs two thousand, and finally the forty and odd thousand signs or words in the English language.

'Having learned that the sign for these two articles pin and pen was composed of three signs, she could perceive

that, in order to learn the names for other things, she had got to learn other signs. I went on with monosyllables, as being the simplest; and she learned gradually one sign of a letter from another, until she knew all the arbitrary tangible twenty-six letters of the alphabet, and how to arrange them to express various objects,—knife, fork, spoon, thread, and the like. Afterwards she learned the names of the ten numerals or digits, of the punctuation and exclamation and interrogation points, some forty-six in all. With these she could express the name of everything, of every thought, of every feeling, and all the numberless shades thereof. She had thus got the "open sesame" to the whole treasury of the English language. She seemed aware of the importance of the process, and worked at it eagerly and incessantly, taking up various articles, and inquiring by gestures and looks what signs upon her fingers were to be put together in order to express their names. At times she was too radiant with delight to be able to conceal her emotions.

'It sometimes occurred to me that she was like a person alone and helpless in a deep, dark, still pit, and that I was letting down a cord and dangling it about in hopes she might find it, and that finally she would seize it by chance, and clinging to it, be drawn up by it into the light of day and into human society. And it did so happen; and thus she, instinctively and unconsciously, aided in her happy deliverance. After she had mastered the system of arbitrary signs made by the various positions of the fingers used by deaf-mutes and called dactylology, the next process was to teach her to recognise the same signs in type, with the outlines of the letters embossed upon their ends. Thus with types, two embossed with *p*, two with *n*, one with *e*, and another with *i*, she could, by setting them side by side in the quadrilateral holes in the blind man's slate, make the sign of pen or pin as she wished; and so with other signs. The next process

was to teach her that when a certain kind of paper was pressed firmly upon the ends of these types, held close together and side by side, there would be a tangible sign on the reverse of the paper, as pin or pen, according to the position of the three types,—that she could feel of this paper, distinguish the letters, and so read,—and that these signs could be varied and multiplied, and put together in order, and so make a book.

'Then she was provided with types having the outlines of the letters made with projecting pin points, which, when pressed upon stiffened paper, pierced through, and left a dotted outline of each letter upon the reverse side. This, she soon ascertained, could serve for writing down whatever she desired, and be read by herself; and also could be addressed to friends, and sent to them by mail.

'She was also taught to write letters and words with a lead pencil, by the aid of the French writing board, which is the most simple, most effective, and cheapest method ever yet invented.'

Dr Howe found great difficulty in teaching abstract relations and qualities to his interesting pupil; and this is also a difficulty with the deaf and dumb. It was thus overcome:—

'She knew that some girls and women of her acquaintance were very sweet and amiable in their tempers, because they treated her so kindly and caressed her so constantly. She knew also that others were quite different in their deportment, that they avoided or repelled her, and were abrupt in their motions and gestures while in contact with her, and might be called, therefore, sour in their tempers. By a little skill she was made to associate, in her mind, the first person with a sweet apple, the other with a sour apple: and so there was a sign for a moral quality. This is a rough illustration; but it is hard to explain the process by which any children come to

understand the names of things in the abstract or moral qualities.

'And so she went on diligently and happily for a score or more of years, until at last she acquired a large vocabulary of words, and could converse readily and rapidly with all deaf-mutes and all persons who could use these signs. She could read printed books readily and easily, finding out for herself, for instance, any chapter and verse of Scripture. She could also read letters from her friends in pricked type, or by the Braille system of points. She could also write down her own thoughts and experiences in a diary, and could keep up a correspondence with her family and friends by sending to them letters in pencil, and receiving their answers either in pricked letters, which she could read by the touch, or letters written with ink or pencil, which could be read to her by some confidential seeing person.'

Dr Howe was induced to begin and persevere in the difficult task of educating Laura Bridgman by the conviction that the human intellect possessed the peculiar gift which the Greeks called the λογος, the faculty which reasons and accompanies reasonings with spoken symbols:—

'I knew that Laura must have this innate desire and disposition, and that although by reason of lack of sight and hearing she could not follow it in the usual way, and imitate the sounds made by others, and so speak, she would readily adopt any substitute which should be made comprehensible to her in her dark and still abode.

'In this faith I acted, and, by holding to it firmly, succeeded.'

From a study of Laura's writings Mr Sangford arrived at the following judgment:—'She was eccentric, not defective. She lacked certain data of thought, but not in a very marked way the power to use what data she had.'

The following deviations from the normal were noted:

The optic nerves and tracts were small and much atrophied, especially on the left side up to the chiasma, beyond which it was larger (vision did not quite leave the right eye till the eighth year). The auditory nerves were small and somewhat atrophied ; the olfactory bulbs small. The circumference of the head was 52·8 c., equal to 20·8 inches ; the cranial capacity was rather less than usual, probably checked in its growth by the illness which closed so many avenues of sensation at an age when the brain had only attained three-fourths of its due weight. The grey matter of the cortex was found by careful measurements to be generally thinner than usual by about one-tenth, especially over the area of the defective senses—to wit, the occipital lobes and cunei and also the temporal gyri. The thinness was most marked over the auditory regions of both sides and the right occipital lobes. The island of Reil was found to be exposed to a marked degree on both hemispheres. The exposure was three times greater on the left side; it was due to deficient development of the lower portion of the third frontal gyrus, and also to the failure of the tip of the temporal lobe to attain full size. This deficiency of the third frontal gyrus was mainly macroscopic ; but on microscopic examination a slight deficiency in the larger nerve cells was thought to be made out. This deficiency of the larger nerve cells, more or less pervading the whole brain surface, was more marked in portions of the cortex taken from the defective sensory areas.

Laura died at the Perkins Institution, where she had spent nearly her whole life, in 1889, being in her sixtieth year. Her brain was made the subject of a most elaborate study by Dr Donaldson.*

* 'Anatomical Observations on the Brain and several Sense Organs of the Blind Deaf-mute Laura Dewey Bridgman,' by Henry H. Donaldson, Ph.D., in the *American Journal of Psychology* for September 1890 and December 1891. At the end of his first paper Dr Donaldson gives a copious bibliography for the study of the subject of persons deprived of the use of several senses.

In the same Report of the Perkins Institution there is an account of a boy named Oliver Caswell, blind and deaf from infancy, who was also educated by Dr Howe, with the assistance of Laura Bridgman. There are at present in the same Institute two girls defective in the same way.*

Dr Down had under his care a boy who was born blind and deaf; the sense of smell and of touch were acute. The brain was probably diseased, and he became epileptic. Efforts to educate him were not successful.

Meystre.

The following account of Meystre is taken from Forster s *Life of Charles Dickens.* When he saw him at Lausanne, in Switzerland, he was a young man of eighteen, 'born deaf and dumb, and stricken blind by an accident when he was about five years old. The director of the Institution is a young man of great ability and most uncommonly prepossessing appearance. He propounded to the scientific bodies of Geneva a year ago (when this young man was under education in the asylum) the possibility of teaching him to speak; in other words, to play with his tongue upon his teeth and palate as if on an instrument, and connect particular performances with particular words conveyed to him in the finger language. They unanimously agreed that it was quite impossible. The German set to work, and the young man now speaks very plainly and distinctly, without the least modulation of course, but with comparatively little hesitation, expressing the words aloud as they are struck, so to speak, upon his hands, and showing the most intense and wonderful

* In a paper entitled 'Une nouvelle Laura Bridgman,' in *Revue Philosophique*, t. xxviii, 1889, M. L. Bélugou describes a pupil in the Perkins Institution named Helen Keller, who lost sight and hearing when nineteen months old. There are some interesting observations, especially about the gradual formation of abstract ideas in this poor child's mind.

delight in doing it. This is commonly acquired, as you know, by the deaf and dumb who learn by sight; but it has never before been achieved in the case of a deaf, dumb, and blind subject. He is an extremely lively, intelligent, good-humoured fellow, an excellent carpenter, a first-rate turner, and runs about the building with a certainty and confidence which none of the merely blind pupils acquire. He has a great many ideas, and an instinctive dread of death. He knows of God as of Thought enthroned somewhere.'

Dr Donaldson mentions a Norwegian girl, Ragnhild Kaata, blind and deaf, who has been taught to articulate.

Kaspar Hauser.

In the sad and mysterious case of Kaspar Hauser we have an instance of superficial idiocy produced, not by loss of the senses, but by deprivation of the power of exercising them. On the 26th of May 1828 a young man was observed tottering about near the Neue Thor, one of the gates of Nuremberg. On examination it was found that he could only speak a few words, meaning, 'I will be a trooper, as my father was,' and that he was scarcely able either to stand upright or to direct the motion of his legs. In fact his appearance was like that of a child learning to walk. The soles of his feet were found to be as soft as the palms of his hands, and covered with blisters, while the condition of his knees seemed to indicate that they were seldom flexed. He was found unable to speak, and perfectly ignorant of the outer world; rejecting meat, but apparently relishing bread and water. On a piece of paper being placed before him, he took the pen and traced the words Kaspar Hauser. A letter was found in his possession, but apparently it was only intended to deceive. He was believed to have been born in 1812. This mysterious affair naturally excited great curiosity, and was the subject

of a careful official inquiry. The interesting foundling was adopted by the town of Nuremberg, and his education was entrusted to Professor Daumer, who took the young man to his own house to educate him, and soon made out that he possessed good faculties, which had never been brought out from the artificial isolation in which he had lived.

When he was able to record his recollections, he said that he never remembered to have been anywhere save in a small vaulted chamber, where he sat leaning against the wall. A man occasionally visited him who never spoke. Bread and water were left by him when he was asleep. It was believed that he was occasionally washed during his sleep, his nails cut, and his clothes changed, and he recognised the taste of opium as having been now and then mixed with his water. Some toys were given him to play with, but he never remembered to have seen either rat or mouse, or any living thing save the man who at last taught him the few words he could repeat, made him practise writing his own name, and finally brought him to the place where he was found—at the gate of Nuremberg.

It was thought that some dreams which he related were revived reminiscences of life in a palace. Daumer, his preceptor, says that Hauser remembered a few Hungarian words.

Earl Stanhope took him under his protection and promised to provide for him. At Anspach in the winter of 1833 he received a stab which penetrated the heart and lungs, and died seventy-eight hours later. Kaspar said that it was from a man who met him in the park by appointment. Earl Stanhope suspected that the wound was self-inflicted, and declared that his late protégé was an impostor.*

* The Duchess of Cleveland, daughter of Earl Stanhope, has written a book to prove that Kaspar Hauser was an impostor who artfully played the part of a child brought up under the privation of light and human intercourse (*The True Story of Kaspar Hauser from Official Documents*. London, 1893.) For a different

Daumer's observations upon Hauser's condition, when first committed to his care, are exactly what might have been expected from his situation.

He could say nothing but the two phrases which the man had taught him. He had the mind of a child, spoke of himself in the third person, mistook inanimate for living things, and natural productions for things made by the hand, and did not distinguish between jest and earnest. Daumer gives a number of instances of his wonderful power of seeing in the dark. At first he did not attend to sounds, but was soon deeply stirred by music. He was very sensitive to odours. Ideas accumulated in his mind with extraordinary rapidity. His memory was wonderfully accurate, especially in recalling particulars to which ordinary people pay little attention, such as how often he had eaten this or that thing. On the fourth month after his apparition he became ill, apparently from the intense working of his mind, and the rapid

opinion the reader may be referred to a review in the *Journal of Mental Science* for January 1894, of which two passages are here given :—

'All witnesses are not equally good, but to three of them who gave evidence in this case we are bound to pay special attention. Hiltel, the gaoler, who first took care of the foundling, and who was used to deal with impostors and vagabonds, bore testimony to his childish demeanour, which seemed to have the inimitable stamp of truth. His preceptor, Professor Daumer, who watched the evolution of Kaspar's faculties and conducted his education, had never any suspicion of imposture, and wrote a book in reply to Earl Stanhope and other sceptics.—*Enthüllungen über Kaspar Hauser, etc.*, von E. F. R. Daumer, Frankfurt a M., 1859. Kaspar's case was carefully investigated by the veteran jurist, Anselm von Feuerbach, President of the Bavarian Court of Appeal, who published a book about him, entitled, *A Crime against a Human Soul*, and also left amongst his papers a copy of a memoir addressed to the Queen, Caroline of Bavaria (see Anselm Ritter von Feuerbach's *Biographischer Nachlass*, Zweiter Band, p. 319; Leipzig, 1853) in which he seeks to prove that Kaspar Hauser was the heir to a princely German house, put out of the way to favour another's succession.'

'Kaspar Hauser must either have been the child of a high family or an impostor. Whichever view we take, there are difficulties and improbabilities to face. We cannot deny that the Duchess has thrown some doubts upon his pretensions, but if he played a part, he certainly played it wonderfully well, and at the outset, at least, for a very poor stake, as for several months he would eat nothing but bread and water; nor is it at all likely that he could foresee the train of events which rendered him conspicuous, but never happy.'

course of his education had for a time to be suspended. The delicacy of his senses and rapidity of his acquisitions gradually ceased, which Daumer somewhat fancifully attributed to his use of flesh meat, and at the time of his death he did not seem to differ much from other young men. An examination was made of the body. The liver was found enlarged. The skull was somewhat thicker than usual, and the brain rather small, not quite overlapping the cerebellum, which was larger in proportion to the cerebrum. The tissue was found healthy, but the convolutions were broader and simpler than usual.

'In this case,' writes Dr Heidenreich, 'the mental development was not hindered by the deficient growth of the brain, but the brain was retarded in its development by the want of all mental activity and excitement.'

CHAPTER XVII

ON THE GROWTH AND MORTALITY OF IDIOTS

Growth of Idiots

SOME observations which have been made upon idiots arranged in subdivisions not quite the same as those used in this book are too valuable to be passed over. I allude especially to Dr Kind's observations on the increase of the length of idiots. We have no measurements of the relative size between a normal and an idiot child during the first five years. Often enough it is said that the latter has been small and weak from birth. As often, on the other hand, it is asserted that it grew like other children. There seems, however, to be a difference in size between cretins and other children already noticeable at birth. On comparing the measurements furnished by Kind, Tarbell, and Roberts* about the comparative size and weight of idiots, we cannot get entire agreement in the figures; but the general result is out of dispute. Above five years of age the idiot, both male and female, is found to be on an average constantly less in size and in weight. At thirteen years, Kind states the difference of a male idiot to be 5 inches below the normal height; Tarbell, 1·65 inch; and Roberts, 1·92. Then at sixteen, Kind states the difference at 4·6, Tarbell at 5·65, and Roberts at 3·60. At twenty, Kind states the difference as 4·01, and Roberts at 3·39 of an inch. As a general

* *Ueber das Langenwachsthum der Idioten*, von Dr Kind, Director der Idioten Anstalt zu Langenhagen. *On the Height, Weight, etc., of Normal and Feeble-minded Children*, by Dr G. G. Tarbell, *Proceedings of Association of Medical Officers for Institutions for the Idiotic and Feeble-minded*, Philadelphia, 1883. Roberts, *Manual of Anthropometry*, London, 1878, p. 104.

rule the difference in weight keeps about the same ratio as that of height, and the increase in height and weight of the male and female observe the same relation as in ordinary children.

Dr Kind thinks that the dwarfish idiots do not live so long as the others, and this is to be considered in taking the average height of adult idiots. The growth of idiots is not only less, but it goes on more slowly. They grow more after sixteen years of age than ordinary people, though they never attain the average height.

As rickets and scrofula are known to depress the height, Dr Kind separated his idiots into the scrofulous, the rachitic, the paralytic, the epileptic, and idiots in general not going under the preceding four classes.

It appears from his carefully-framed tables that epileptic idiots grow most. The later the epilepsy the less effect it has upon the growth. Paralytic idiots do not grow well, and fall below the average of the rest.

Scrofula and rickets had an influence in depressing the height; but those idiots who neither had scrofula, rickets, epilepsy, nor paralysis, nevertheless fell below the usual rate of increase of normal children.

Dr Kind, in a series of very careful observations upon the height of idiots compared with the size of the head, shows that the skulls of idiots are in general bigger than what one might have anticipated from their low stature.

Imbecile girls, about or a little after the time of puberty, often get very stout, some of them enormously so, as in the accompanying portrait of a girl of sixteen years old, who weighs 166 pounds. Her height was 65 inches.

This was a genetous imbecile; she could dress herself, spoke on simple subjects, had learned to read words of two syllables, and to do a little work. She died at the age of nineteen years, apparently owing to the effusion of blood

into the lung. During the last two years of her life she was mostly in the hospital, having Raynaud's disease of the toes, with occasional bleedings at the gums. Ulcers repeatedly healed and broke out again ; I amputated one toe. The skull was thin and slender in make, somewhat small, and, generally speaking, of imperfect development. The sagittal and coronal sutures were still open ; the serrated arrangements were not well-marked. The foramen magnum was

Fig. 11.
Imbecile Girl, very stout.

unusually small. The encephalon weighed 42 ounces. Nothing abnormal to the naked eye was noticed in the brain, save that the posterior cornua of the lateral ventricles were wanting on both sides. There was a great deposit of fatty tissue both under the skin and in and around the internal organs ; the liver was yellow, approaching to cream colour ; to the naked eye there was no trace of the usual lobular arrangement. The uterus was about the size of a big bean ; the ovaries rudimentary ; the woman used to menstruate.

Mortality.

In a lecture delivered to the International Health Exhibition Dr Shuttleworth found that the average death-rate of the Earlswood and Royal Albert Asylums was :—

From five to ten years	50·1	per	thousand
„ ten to fifteen „	33·9	„	„
„ fifteen to twenty „	45·1	„	„

The average mortality of the whole population in England for corresponding years was given by the Registrar-General as 6·1 for the first period, 3·35 for the second, and 4·75 for the last. Thus the death-rate for the inmates of these institutions between the ages of five and twenty years was at least nine times as great as that of sound-minded young persons at the same period of life. This great mortality hardly indicates to the full the unhealthiness of imbecile children and their proneness to nervous and other disorders, but it enforces the moral that 'a medical man should be in charge of all institutions for their training and care.'

I have not sufficient data to form an opinion what the general probability of life is in idiots and imbeciles under favourable conditions. It is certain that the mortality varies much with the care expended upon them, and with the medical skill of those in charge of them. In some asylums for idiots the death-rate is very much higher than in others.

When I left the Larbert Institution the directors were induced to put in a lay superintendent, and for the treatment, to make use of the services of a medical practitioner in a town three miles off, although the constitution specified that there should be a resident medical officer. One of the directors told me that they had been advised that it would be sufficient for the medical attendant to visit the establish-

ment three times a week. On my pointing out to another director the low mortality maintained up to this time, he replied that it was a healthy place, meaning that the low death-rate was due to the salubrity of the site. I made no commentaries on these estimates, which evidently allowed no credit to my anxious care of the ailments of the inmates, and the opportunities for prophylaxis and early diagnosis given by residence and close contact; but I resolved to wait the results of time, the most powerful of all controversialists. At Larbert I had but fifteen deaths in ten years, an average mortality of 15 in the 1000. I left the place in April 1881 in good hygienic conditions, with a newly increased water-supply —a serious want in my time. For the next month, at least, my place was supplied by a resident medical officer. In the next report due attention was called to the fact that for that year there had been no increased mortality. That no further attempt was made to continue this line of argument may be inferred from the following figures collected out of the Lunacy Reports :—

In 1881 there was one death to an average number of residents amounting to 124; in 1822, six deaths to an average of 133; in 1883, three deaths to an average of 159; in 1884, eight deaths to an average of 182; in 1885, ten deaths to an average of 184·5; in 1886, seventeen deaths to 180 residents; in 1887, nine deaths to 177·5; in 1888, fourteen deaths to 180; in 1889, ten deaths to 189; in 1890, eight deaths to 197·5; in 1891, nine deaths to 206; in 1892, ten deaths to 215; in 1893, twelve deaths to 225·5; in 1894, eighteen deaths to 231; in 1895, twenty deaths to 246 residents; and in 1896, seventeen deaths to 260 average residents.

Thus the death-rates at the Larbert Institution from 1881 were successively 8 per 1000; then 45; then 18; then 43; then 54; then 94; then 50·6; then 77; then 52·9; then 40·5; then 43·6; then 46·5; then 53·9; then 77·4; then 81·3; and

then 65·3. Thus the average mortality from the year 1881 to 1896 inclusive is 53·2 per 1000. It is hoped that these statistics fairly indicate that the personal care and attention of a physician devoted to a difficult subject may have results capable of being rendered apparent through figures.

Dwarfs.

Sometimes pachydermic idiots are exhibited as dwarfs; but the ordinary dwarfs shown at fairs are not imbecile. They are the survivors of those who are born with achondroplasia, an arrest or perversion of the normal process of ossification, which especially affects the limbs, and does not reduce the size of the head. Those dwarfs in whom the skeleton is well formed, though on a small scale, are rarer, and form the choice specimens for show. The dwarf, Tom Thumb, had about the same stature and size of head of a child of from thirteen to fifteen months old. He was said to have some intelligence. The 'midget,' Lucia Zarate, said to be nineteen years of age, was only twenty inches high, and weighed about five pounds. She seemed well proportioned. She was exhibited along with a male dwarf, seventeen years old, who was taller, and weighed nine pounds. The head in both these creatures measured about one-fifth of the whole height; in the normal adult it is one-seventh. Lucia Zarate was, of course, microcephalic. The showman said that her head measured 12 inches in circumference. I have no doubt that she was imbecile. When I asked to be allowed to speak with her, the showman said that she could only speak Spanish. When I replied that this would not prevent me, he positively refused to allow me to address her.

In *Pediatrics*, vol. ii, p. 369, Dr J. D. Nagel, New York, gives a description of a dwarf, Paulina Musters, who died

of pneumonia and meningitis at the age of nineteen years. She had the appearance of a fully-developed woman on a reduced scale. She was found to be 24 inches in height; the leg from hip to tip of toe was 12 inches; girth of chest about 18 inches; the circumference of the head was 16 inches—dimensions which might do for a child six months old. Dr Nagel tells us that 'this tiniest of women was nearly perfect in bodily development, of rather pleasant features, graceful in all her motions, of a good general education, speaking four languages—her native Dutch, French, German, and a little English.' She used to perform some feats in dancing and lifting weights, and told the history of her early life. Are we to suppose that those areas of the brain used for the perception of bodily changes, and the incitation and direction of muscular motion, were on so diminished a scale as to suit her tiny body, and that this left room for the exercise of normal mental capacities within so small a skull?

CHAPTER XVIII.

ON INSANITY IN CHILDREN AND INSANE IDIOTS.

In considering this subject we must ever bear in mind the great difference in the character of children from that of grown-up people. Many of the mental processes which play so important a part in the life of the adult are either wanting or rudimentary in the child.

We should also recall what was said in a preceding chapter about the development in the growing child. Both structurally and physiologically its brain is in a shifting condition. The cerebral tissues are more watery; the processes of growth go on rapidly; the number of blood globules is greater; the circulation is quicker. Rapid changes in the amount of blood entering the brain, rendered easier by the unclosed sutures and open fontanelles, answer to the sudden transitions of moods and passions in the child.

The first mental manifestations of a child consist of sensations and motions. The first sensations are passive, or associated with instinctive motions such as respiration or sucking. It is difficult to distinguish the first voluntary motions from involuntary ones; they are of a simple character, prefiguring processes important in after life, such as turning the eyes, grasping with the hands, or conjoint movements of the legs; touch and taste are exercised before sight as distinguished from the mere consciousness of light; and the sense of hearing comes last. Slowly the child entertains the idea that some things are apart from itself, that there is

an objective world and beings like itself; then it recognises that there is a difference between living and dead objects. We do not hold that there are innate or connate ideas, but we think that there is a tendency which favours the evolution of certain ideas or ideas in certain directions. The statue does not exist in the stone block; but there are certain lines of cleavage which render more easy it being sculptured in given waves, curves and angles. Slowly does a child reach correct interpretations of the phenomena of Nature and learn to make use of the muscular machinery of the body. As ideas accumulate it confounds what it hears with what it has experienced, mixes its fancies and dreams and experiences in its memory. One sensation after another catches hold of his mind before he learns to concentrate his attention in distinct channels, so that children give a fugitive notice to things which adults habitually pass over. Sanity is generally regarded as the natural and healthy growth of a man's character, and insanity as something diseased or abnormal, and in the main this view is right; nevertheless we may gain clearer conceptions by looking on the matter in a different aspect. The sanity of a child is something quite different from that of a man; the senses in the child are most acute; pain, disgust, deprivation, are resented with passionate keenness and provoke bursts of wrath or weeping. When angry, his whole frame is agitated, and he strikes inanimate objects and sometimes himself. With a deficient experience and imperfect judgment children believe whatever is told to them, invent fictions, and make grotesque assertions; they are subject to vain terrors, and smile at real dangers. Some children are apt to indulge in acts of cruelty to animals and gloat over tales of bloodshed. Thus if a man grew up with such feelings and views persisting, he would be regarded as insane. The purpose of education is to substitute some ideas for others, to add new ones in certain directions, to check

some propensities, favour the growth of others, and in general to teach the youth how to regulate his actions in regard to other beings and the outer world. Thus sanity may be regarded as something acquired or something implanted in a man, and perhaps not always something entirely according to reason. We may recall that at certain stages of civilisation some moral precepts are questionable, and some of our conventional notions are scarcely reasonable. Nevertheless, a man who should in public transgress our conventional rules and customs would likely be thought insane, much more likely than if he broke through some of the maxims of our moral code; the vulgar, indeed, often confound one with the other, and absurd customs, once generally adopted, often last for ages.

If we suppose excited or abnormal brain functions from the very beginning, we should expect to find such symptoms as excessive irritability or sensibility to painful impressions, morbid tastes, and perverted motor activity, restlessness, tremors, or choreic movements. Congestions are common in the rapidly growing brain of infancy; the new-formed nervous tissue is of an explosive nature, has the quality of convulsibility in a greater degree than in later life, hence children are more prone to epileptic attacks. One can easily see how such a constitution will interfere with the growth of the brain and also with the due acquirement of the use of the senses and the learning of the proper use of the muscles. Intellectual and moral disorders can only come later, for delusions and mental exaltation imply the possession of a certain number of ideas. Insanity in very young children is always accompanied or masked by idiocy. It is easy to see how excited or perverted function must so check and derange the growth of the brain that its complete and healthy development is impossible; thus though some forms of idiocy, such as genetous or hydrocephalic, may show general feeble-

ness of all the mental faculties, the deficiency is often unequal; the faded lines are weaker in some places and more vivid in others; some faculties suffer less, and others take on a morbid action.

Mad Idiots.

Leaving out of question the deficiency of intellect, a number of idiots may be regarded as also insane, though they are generally harmless, and owing to their softness and want of resource are scarcely to be dreaded. The habitual epileptics, who are mostly all strange and droll in their ways of thought, association, and expression, are generally irritable, and sometimes subject to fits of furious passion.

I have seen violent motor outbursts in idiots of low grade. In one case, well known to me, a child would rush about, leaping over or knocking against articles of furniture, or dashing her head against the walls or floor, so that, if left alone for a minute or two, her face and hands would be hurt and bruised. Along with motor restlessness there is often a strange indifference to pain.

I have seen some idiots in whom the destructive propensity was very marked. An old couple brought me several times a boy of seven or eight years of age, of whom they were very anxious to get rid, and no wonder. He tried to seize and tear everything that met his eye in my office, and gnawed the marble chimneypiece with his teeth. He would rush out of his father's house and into those of the neighbours, breaking and destroying everything he could get hold of; clocks, which in cottars' houses in Scotland have often no cases, were especially singled out for his destructive attacks. When the carters stopped at the village public-house and went in to refresh themselves, he would rush out and throw stones at the horses till they ran away. Inexorably mischievous, he was perpetually getting his parents into trouble and expense.

Imbecile Lunatics.

I saw an insane imbecile, twelve years old, who had been three years in the Royal Albert Asylum. He could speak and answer simple questions; he was restless, noisy, and aggressive, and could not be kept in order in the school. He was little sensitive to pain, but afraid of the induced current. His attendant told me that he had pulled off the nail of the big toe with his teeth; and, one morning noticing that the boy's eyelids were swollen, his eyes being shut, he found that he had put metal buttons, taken from his coat, under the lids of his eyes. This boy did not take fits, but had maniacal exacerbations, after which he slept more than usual. The attendant said that during these turns he would tear his clothes and dirty the bed. Sometimes he would boast that he would do so, and do it.

I was once called upon to see at her home a weak-minded woman, twenty years of age, rather good looking in face; teeth good, $\frac{14}{14}$, irregular; palate somewhat high. She had never menstruated, and was getting very stout; she could read, write, and sew a little. She had been for about a fortnight in an agitated and melancholic condition, continuously talking and muttering. Her pulse was normal and her face was not flushed, but she had an anxious expression. She asked me immediately in an excited manner to give medicine to save her little niece; said that her baby niece was dying; then said that one of her nieces had died last night. She said that she was perpetually haunted by fears that some harm would happen to her little nieces,—her sister's children,—who lived in the same house with her and were quite well. She was not violent, slept and ate pretty well; said she had seen a shark the other day and that it had bitten her.

K. C., an imbecile girl, had been educated at home. Could read a little and do work. When seventeen she became solitary, sleepless, irritable and troublesome, and had some delusions, especially that a man in the neighbourhood used to throttle little children and throw them down dead by the roadside. I prescribed for these two young women, gave some directions, and heard no more of them.

I had at one time at Larbert a remarkable trio who exhibited divers insane perversions of mind superadded upon imbecility. The first was a lad, N. C., believed to have a neurotic heredity, had fits in early years, and was of a very passionate temper. When under my care (in 1872) he was about twenty years old, his head was of the normal size, he had thirty-two teeth, pretty good, some were beginning to decay. Though he had a shambling gait, he was strong and healthy, could converse on simple matters, though he generally confined himself to one subject. He had learned in the joiner's shop to saw and plane tolerably; but could not be taught to count or to read. His attention was much directed to the construction of the house, much of whose building he had witnessed; and to the drains, the construction of which he understood wonderfully well. Though he could plan the making of some simple article in wood, he never had the patience to carry it out, but was diligent in pulling down anything. He was skilful in breaking up logs with an axe and wedge, and when no more such work was to be had, he would prowl about to seize upon boxes to split up. His attention only followed his likings. When there were magic lantern exhibitions or theatricals, or some show or feast which attracted every one else, he might be seen calmly splitting wood in the moonlight. He took a fancy to have rabbits, got a wooden hutch made for them, and begged for broken victuals from the kitchen; he devoured the food himself, and cried passionately when the animals died of

starvation. Essentially one-idead, he was easily irritated by any one suggesting something disagreeable to him. The younger boys soon found out how to tease him, which could be done in the simplest manner by saying that he would not get home for his holidays. His explosions of wrath were no doubt ludicrous, but threatened to be dangerous; he would give a shout, throw down his axe, and run after his tormentors. They generally escaped; when he caught them he handled them roughly. It never occurred to him to use his axe, otherwise his wrath might have been deadly. One boy was particularly skilful in tormenting him,—J. M., illegitimate, a pauper boarder with a rather small head and prognathous face. At that time he was about ten years old; a little, broad-shouldered, sturdy, and active boy, with eyes always rolling about to note occasions for mischief. When punished he would howl, but never shed a tear, and the effect soon passed away. I never saw him angry nor show any ill-will to those who punished him. From his uncouth appearance he was sometimes called the 'Ancient Briton.' He would come to my window and say, 'I have been a very good boy to-day. I have not stealed the whole morning. Will you give me a piece?' Once, happening to look out, I saw the Ancient Briton approaching the window with a lighted paper; the iron valve of the ventilator had become loose, and the creature had filled the empty space with shavings which he intended to set fire to, and then, no doubt, close the valve and leave the blaze to appear through the floor. With such a genius for mischief he could not neglect N. C. He would steal up to him behind the stake paling, and in a low voice announce some impending misfortune, repeating the words again and again; the effect was mesmeric. Although N. C. knew the boy to be a liar who had often deceived him, the idea suggested entered into his mind and occupied it entirely.

He would yell and dance about, when his tormentor would run away in high glee. During these passions N. C.'s face, head, and neck used to flush red. It occurred to me to get cold water poured on his head, which caused immediate abatement of his fury. After this he would himself put his head under the pump and cry, 'Pour water.' This had always the effect of relieving him.

There was another inmate, a little, mendacious, mischievous fellow, who sought the society of the Ancient Briton. He evidently regarded the said Briton as a hero and a model, and sometimes assisted in tormenting N. C. It was difficult to keep them apart, and their commerce boded no good. This was a boarder from the middle classes. I gave no encouragement to his mother to place him in the Institution; but not being my own master, could not refuse boarders; and some parents seem to believe that the advantage derived from special lessons would outweigh the evil suggestions to which the weak-minded children became exposed, from being brought within contact of the residua of the worst quarters of our large towns.

The last exploit of the Ancient Briton was slipping down the railway embankment and putting stones on the rails. The attempt was discovered a few minutes before a train passed. The secretary of the railway company had refused to erect a proper barrier, saying that they were only bound to make a fence sufficient to keep out sheep. Explaining to that economical official that I was prepared, when a catastrophe occurred on the railway, that he should have a due share of the blame, I induced him to get a high stake fence erected.

Moral Imbecility.

We now and then read of 'moral imbecility,' a variety of the unhappy invention styled 'moral insanity,' originally

intended to signify a total want of moral feelings as proved by reckless and shameless conduct without any intellectual impairment. But a man, who through pure want of moral perception should behave with such senseless wickedness as to bring himself into a jail or asylum, would, by so doing, prove that he was deficient in intellect as well as in moral capacity. Even if a man were wholly destitute of any moral feeling or speculative respect for ethics, he would at any rate recognise the moral code as so many regulations, to transgress which would entail consequences most unpleasant to himself. In fact, it would only be the deficiency of intellect which would remove all prudential checks to open disregard and defiance of the recognised rules of morality. The title 'moral imbeciles,' however, is so far correct that there are children who show from the beginning a proneness to evil, a callous selfishness, and a want of sympathy with other people, which is the most striking part of their character. The want of sympathy and the want of perception of moral relations seem out of proportion to the mental deficiency; but in all the cases which I have seen there was also weakness of intellect.

In dealing with such children I have always found at least some germs of moral sentiment which have enabled me to effect a noticeable improvement, though scarcely so much as their guardians expected.

K. N., supposed to have encephalitis when eight months old, of strumous constitution, blind of one eye, and somewhat dull of hearing. He was rather unsociable, taciturn, and easily annoyed, but could speak freely when he chose. He was taught to write well, though he never could read even what he wrote. He was enthusiastically fond of drawing and of carving in wood. He used to make original drawings, and fabricated little toys which he would sell to the other boys. The first symptom of insanity was his smashing panes of glass in the passage and other places where he would not be readily

noticed. When asked why he did so, he said that he liked to see the glass fly. This went on for about six months. One day he took out of his pocket a knife which he had got hold of, and deliberately made an incision in a boy's hand. When asked why he did so, he gravely said, 'I thought Andrew wanted me to do it.' At last one night he produced a hammer, and rushed through the boys' dormitory striking at everybody. After this it was thought too dangerous to keep him in the house, and he was sent to an asylum. I am told that he is still addicted to breaking glass, and is liable to outbreaks of passion. He was seventeen when he left us, and had been above seven years in the house.

H. S. was seventeen years of age when admitted. The

Fig. 12.
Imbecile Girl with Melancholia.

imbecility was believed to be from birth. The head was small, palate rather high, teeth beginning to decay, complexion very fair. She could dress and feed herself, and was said to have been good-tempered save when ill, when she

got peevish and jealous of the younger members of the family. When admitted, was much emaciated. From the beginning the girl was very obstinate and in low spirits, and for more than a month was in the hospital, after which she improved and was sent to school. She learned to sew a little, and to know a few letters, but was always peculiar, and did not like the children to come near her. After three months her health got worse, and her spirits became lower than ever. She frequently moaned all night, cried when anybody touched or looked at her, and was very perverse and dirty in her habits. It was a clear case of melancholia. As imbeciles in general are merry and good-natured, she met with little commiseration from the other children, who called her, in their expressive Scotch, the 'whinging lassie.' There were symptoms of tubercle in the lungs. The spleen was enlarged; the feet were swelled; and the face sometimes flushed on one side. I suggested that her mother should take her away for change of air, when she came and removed her. The girl died about two months after 'of bronchitis and diarrhœa.'

Dr Wells* tells us that amongst cretins of the higher degree, more especially when neglected or ill-treated, attacks of mania are by no means uncommon. Under its impulse, as has been related by Wenzel, murder has actually been committed. Other authors have mentioned a peculiar suicidal form of this affection, which prompts the wretched maniac to attempt self-destruction by throwing himself into the fire. According to the Sardinian Report, these maniacal attacks in cretins are rare. At the great lunatic asylum at Bassens, near Chambery, in Savoy, I only saw one cretin. He was about twenty years of age, and said to be very malicious.

Insanity in children uncomplicated with idiocy is so uncommon a malady that it is difficult to generalise about it or to make out what symptoms are most frequent and character-

* *Cretinism and Goitre*, London, 1845, p. 58.

istic, and what forms are commonest. Two books on the subject are known to me, *Die Psychischen Störungen des Kindesalters*, von Dr H. Emminghaus, Tübingen, 1887; and *La Folie chez les Enfants*, par le Docteur Moreau (de Tours), Paris, 1888. On looking over these thoughtful and learned works, we soon see that the great majority of the cases described are taken from observations of others, many of them published simply because they are rare. Emminghaus finds all forms of insanity amongst children,—Neurasthenia cerebralis, Melancholia, Mania, Dementia in its stuporose and agitated forms, Paranoia, Transitory and Circular Insanity, Epileptic, Hysterical, and Choreic Insanity, Toxic Insanity. We have also cases of General Paralysis in children of ten or twelve. I have seen general paralysis supervening upon an imbecile boy, and other cases are on record. They are probably of syphilitic origin.

Causes.

A neurosis in the family of the parents is by far the most common predisposing cause of insanity in children; it renders them liable to be acted on by various exciting causes. Insanity may be owing to morbid products in the blood, as from the nephritis after scarlet fever. Fright appears to be a common exciting cause. Injuries to the head, sometimes dated years back, are often assigned as the cause of the attack. A case has been recently described by Professor Furstner * of a boy of normal intelligence who sustained a severe injury to the head when nine years old. This was followed by loss of intellectual power, moral degeneration, dirty habits, and slight convulsive movements in the right arm. An opening was made in the skull, and a hard depressed portion of bone removed, on which he recovered.

* *Archiv für Psychiatrie*, xxviii Band, 2 Heft, s. 506.

Dr Reich * describes some cases of transitory insanity which seemed to be simply the result of exposure to great alternations of cold and heat. Four boys, from six to ten years of age, had been exposed in a sledge to cold of from 16° to 22° below zero ; and being suddenly introduced into a room heated by a stove, they showed symptoms of mental derangement lasting for several hours. There were maniacal excitement, delirium, and hallucinations. This condition passed off with a long sleep, and on awakening they retained no recollection of the mental disorder, and complained of nothing but slight headache. These attacks are supposed by Dr Reich to have been caused by an alteration in the cerebral circulation, most likely hyperæmia, induced by the rapid change from cold to heat.

Character and Symptoms.

As there is a certain persistence in the mental character of adults up to extreme old age, we can describe their derangements so that the sketch has a general resemblance throughout, but with children there is a continual growth and change ; hence to give a fair description of the insanity of children, one would need a series of shifting views of the most frequent symptoms for every six months. As we might expect, in the youngest children the manifestations of insanity are of a simple character, principally motor—great restlessness, sleeplessness, crying, and screaming ; in older ones, biting, scratching, tearing clothes, and running blindly about. The changes and reactions in a child's brain come rapidly, and pass away rapidly. The pulse quickens ; the temperature rises ; the face flushes ; the child is in a fury, but this soon subsides, to be replaced by another mood. When it persists beyond usual limits it takes the form of delirium, indicating

* *Berlin. klin. Wochenschrift*, xviii, 8, 1881, quoted in *Centralblatt für Nervenheilkunde*, No. 6, 1881.

transitory congestions of the brain, or a state of irritable brain of more or less duration. With children old enough to be called reasonable beings the passions and affections appear more involved in insanity than the intellectual faculties. Where delirium is absent, the behaviour is affected, the child is heedless of control and careless of reproof. The tendency to lying and stealing is much increased. While the senses with children are very active, they receive their ideas—that is, the interpretation of sensations—from others, and mix up their dreams, memories, and fancies; their beliefs are ingenuous, errors are common, the critical faculty is little used. Hence delusions in the child would not attract much attention nor influence conduct as in older people. We now and then meet with transitory fits of temper and perversity in children which in adults would be put down as temporary insanity. Indeed, in some cases of insanity in grown-up people we hear rumours of strange affections and doings having been observed in their childhood. In general, even when derangement is very decided, there is a want of persistence in the mental delusions of children. Sometimes, however, a child grows up with an abnormal strangeness of thought, affectivity, and exaggeration or perversion in the motor activity. In such children the whole manner of receiving impressions, resenting injuries, moving and speaking, goes on after an eccentric fashion. When this occurs, especially if there be neuropathic affections in the family, the prospect is ominous, even if the child's intelligence be not marred in its growth and education.

The Germans have described a form of insanity to which they have given the name of *Primäre Verrücktheit*, in which the mental powers are warped from childhood. Strange notions, empty vanities and boastings, sickly suspicions, mark the child as different from others. The mind does not develop in a healthy manner. Morbid ideas of greatness,

jealousy of neglect, fears of ridicule, and suspicions of unfairness and persecution, choke the healthy feelings of youth, and, as the individual grows older, pass into full-blown delusions, constituting a form of lunacy to which the name of Paranoia is given. I knew a man in whom I traced the characteristic symptoms unfolding from childhood. He died in an asylum, and his elder brother died insane thirty years afterwards.

Hallucinations occur especially in older children, sometimes brought out by the delirium of fever or by their sequelæ. Thus I have a note of a child of five years who suffered from tertian ague. During the febrile attacks he had delirium, and figures of black men appeared on the roof; he had frightful noises in his head. These attacks recurred eight or ten times. Under the use of quinine the ague disappeared and the delirium with it.

In general, fixed ideas and delusions are not common with insane children; as in ordinary childhood, the ideas are mobile, and rapidly succeed one another. Inordinate mental excitement soon leads to exhaustion. The insanity of children who have reached the age of twelve differs less from that of adults. Its character may depend upon the greater or less maturity of their intellect.

Melancholia.

Dr Emminghaus found that out of 199 cases of insanity in children described by various writers, 24 were affected with melancholia. It seems principally to affect young persons above twelve years, and is generally of a simple character. The child gives up his play, neglects his lessons, avoids his companions, shows little affection for his parents, seeks to be alone, and in general loses interest in everything, and is in a depressed state of mind. Melancholy, with delusions, is rare with children.

Suicide in Children.

A frequent exciting cause of suicide in children is the fear of punishment and disgrace. Children are often subjected to great tyranny while their organisation is very sensitive, and they are apt to plunge into actions without weighing the consequences ; but hope is so strong and life so buoyant in the young breast, that we may safely conclude most cases of suicide in childhood indicate an insane condition of mind.

In Italy, Morselli found that out of 1000 suicides, 5·3 per cent. were males from ten to fifteen, and 5·7 females out of 1000 cases of female suicides. From Morselli's tables it appears that in some countries the number of suicides under ten years of age is much higher: 5·6 in the 1000 in France. It is given as 3·6 in Saxony, 14·1 in Switzerland, 13 in Prussia, 19·6 in Austria, 23 in Hungary, and 24 in Würtemberg. As might be expected, self-destruction is less frequent in childhood than at any other age. The commonest period is from forty to fifty years. Females are less prone to self-destruction than males, but this is less marked in childhood than at a later age. In France the proportion of female to male suicides under sixteen years of age in the whole population is less by one-half; but taking 1000 male and 1000 female suicides under sixteen, the proportion is greater with females by one-third.* According to Morselli, suicides amongst children were from 1861-1870 rarer in England and Wales than in any other country from which he had statistics, being 4·6.

It is now increasing in frequency. 'From 1865 to 1874 in England,' Wynn Westcott tells us,† 'there were 81 suicides' from ten to fourteen years of age,—45 male and

* Socquet, 'Étude Statistique sur les Suicides en France,' *Annales Médico-Psychologiques*, September 1889.

† *Suicide*, London, 1885, p. 111.

36 female. The ratio between shows female precocity. Child suicide is increasing in England and in almost all the Continental states. But what undoubtedly causes many cases now is over-pressure in education, while the education itself produces precocious development of the reflective faculties, of vanity, and of the desires. During the last few years there have been several English cases of children killing themselves because unable to perform school tasks. Dr Strahan, writing eight years later, observes:*—'In England and Wales for some years past the suicides of children under fifteen years have averaged over 10, while those of persons under twenty have averaged between 90 and 100 annually. It is significant of the increase of this most pitiful form of self-destruction that the Registrar-General had latterly found it convenient to add an extra column for the reception of self-destroyers whose ages are between five and ten years.' 'No one denies that child suicide is on the increase, and the high-pressure system of education is generally set down as the cause of the greater part of it. In support of this it is pointed out, that in those countries in which education is forced on most strongly, child suicide is found at its highest.'

Dr Durand-Fardel† has collected twenty-six examples of children who attempted suicide; at least seven of these were girls. Twenty of them accomplished their design. Most people would say that these children were insane, though with many of them no derangement was suspected before the suicide. The most frequent motive was being punished or harshly treated by their parents or teachers. In some cases the motives are very childish. A boy of nine years old killed himself because he lost a bird which he was fond of.

* *Suicide and Insanity*, London, 1893, p. 175.

† 'Étude sur le Suicide chez les Enfants,' par M. le Dr Max Durand-Fardel, *Annales Médico-Psychologiques*, 1885, p. 61.

A boy of twelve hanged himself because he was no higher than twelfth in his class. He gives an account of a boy who hanged himself without any known motive; after which a boy of fourteen and a half years, who was at the funeral, hanged himself, apparently out of imitation. Sometimes great determination is shown. In one case a boy of twelve years old, for accidentally breaking his father's watch, was shut up in a room with a bit of dry bread. In the morning it was found he had hanged himself by running a nail into the wall, to which he attached a cravat. His knees were bent, and nearly touched the ground; so he must have had the resolution to hold them in that position till he was insensible, for at any time he could have escaped death by simply putting his feet to the ground. He was said to be an intelligent child, and liked by his companions. He never complained of being badly treated by his parents, but said that if there was a blow to get from his father it came to him, and never to his sister, who was always preferred before him.

Dr Durand-Fardel remarks—'Suicides in children are almost always characterised by their *sang froid* and premeditation. Before the time of puberty, which changes children into men, the idea of death is not accompanied by that sentiment of horror which, often at a later age, is sufficient to preserve one from suicide. Until a certain age children do not understand death, later they do not realise it. We have seen many children who were big enough to understand that they were going to quit life, but we never remember to have heard any expression of terror or despair.'

Mania has been observed in children of five or six. They are furious, smash and break, strike younger children, or use threats against older people which their strength is ludicrously insufficient to carry out. Such are often connected with epilepsy, chorea, or the cataleptic state; indeed, epilepsy is by

far the most common cause of insanity in children, and where epileptic attacks occur, eccentricities of conduct may be looked for, such as stealing, cruelty to animals, sleep-walking, or some strange outburst of temper or change of mood.

The following case has been seen by me in the Derby County Asylum :—G. O., admitted 6th November 1895. No history of insanity or epilepsy in the family. A seven and a half months' child, born after a fall of mother. Now in good condition, aged six years; height, 3 feet 9½ inches; weight, 3 stones 7 lbs. I examined him on the 6th August 1896. A fair-complexioned boy, apparently in good bodily health. He had grown an inch since entry. I made some measurements without finding anything abnormal in the head or body. Teeth good, $\frac{10}{8}$, two of the lower jaw lost. Palate high, glands of palate enlarged. Left lip paralysed. In speaking, 'l' and 'r' were replaced by 'y.' Thyroid tumid, noticed to have enlarged since entry.

He made himself intolerable in his father's house. He took fits occasionally, and had that reckless impulsiveness often met with in epileptics. He used to fill his pockets with rubbish, ate garbage, was constantly throwing articles into the fire, would furtively strike his brothers and sisters, and threatened to poke out his mother's eyes. In a report sent to the Commissioners in Lunacy, Dr Lindsay says that he was 'very restless, mischievous and troublesome, constantly on the go, prone to interfere with other patients, and with a strong propensity to pick up rubbish and fill his pockets, and to throw stones or other things about; has thrown a stone at the window here. Laughs immoderately and without meaning, and screams at times; prone to ramble and chatter; says he is married, that he has been married a fortnight, and that he has been stopping in this house eight times. Admits sometimes striking his brother and sister; but does not appear to realize that it is wrong, and says his mother canes

him for it. Has to be washed, dressed, and attended to. He might probably derive benefit from special training and education in a properly equipped institution. It is a matter for regret that such a case should be sent to a pauper lunatic asylum.'

On the 6th of July he had an attack of *petit mal*, and was dazed and stupid, but soon got over it. He was still very mischievous, used to throw stones at the patients or any one passing the airing court.

The boy answered questions smartly and chatted freely. He seemed a forward, shameless child. He said he liked being in the asylum, as there was always something to see, like cricket matches. He said he had four fingers. Next day he said he had five, but that he had four toes. He told me that he had twenty-two buttons in his pocket, and produced twenty-one.

Fire, with its bright flames and power of rapid destruction, has a fascination for the weak and unstable minds of such children. It becomes fixed as a dominant idea, which they try to put in practice with marvellous persistence. Thus in spite of watching and discipline they sometimes succeed in setting private houses and even asylums on fire.

A boy of eleven years of age,* of a neurotic family, had fits, which began when he was two years old, after which he was subject to attacks of epileptic vertigo. He was an ill-grown boy of average intelligence. On December 2, 1887, he was peeling potatoes with a knife, when he suddenly commenced to brandish it about. He then rose and threw himself upon some other boy, when he was mastered and carried away to his bed. In the evening he was brought to the hospital. Next day he again fell into a fit of fury, and on December 5th he attempted to strangle a little girl younger than himself. More than twenty-four hours passed

* Described by D. Audry in the *Lyon Médical*, February 26, 1888.

in alternations of extraordinary fury and profound coma, which generally lasted about twenty minutes. During the attacks of fury he rose and danced about, tearing and biting everything he could catch hold of. We are told, however, that he respected his own fingers, which he sometimes inserted into his mouth. On December 13th these fits of fury had ceased, but were renewed on January 8th, when he had three attacks, which lasted some minutes.

Two remarkable cases are described by Dr Robert H. Porter,* Louisville, Kentucky. Ernest B., a boy, aged nine years, was run over by a street car. Four weeks after this accident he was observed sitting on a fence in a state of reverie; paid no attention to any one. This lasted for half an hour. This attack was repeated the next day, and the attacks were associated with spasms. Three or four days after he passed into a state of mania, which lasted for a week. During this time he was very violent, often attempting to commit suicide, and to kill some member of the family.

'After the mania subsided, the spasms returned in the form of both *grand* and *petit mal*. Several days he would have as many as a hundred attacks of *petit mal* a day; then again they would be less frequent, but more severe; often fifteen or twenty attacks of *grand mal*. Sometimes instead of a spasm he would have a short period of trance, and while in this state he would have a vision of God in heaven with the holy angels, and would see the golden streets of the New Jerusalem. While in this condition he would usually talk all the time, telling them what he saw. After he returned to consciousness he would remember the vision, but did not know that he had been talking about it. Occasionally, instead of a spasm or trance, he would have a short period of frenzy or epileptic *furor*, in which he would attempt to do violence to himself or

* *New York Medical Record*, September 5, 1885.

to someone else. This condition of spasms, trance, and mania had continued for about three weeks.'

Four or five days after Ernest had quieted down, his brother Claude had a severe attack of hystero-epilepsy ; this agitated Ernest so much that the spasmodic troubles returned. He fell into a trance state, which continued for twenty-four hours, after which he recovered without any further relapses. The brother Claude fell into a state of frenzy, barking, and biting the attendants. He had opisthotonos, emprosthotonos, and facial contortions, would or could not swallow anything. After this he passed into a state of trance, and then back again into a vicious and combative condition. Seven weeks after his first attack the boy was still in a state of trance, creeping about on his hands and knees, with his eyes shut. These two brothers were the only children in the family. There was a record of consumption in the mother's family, but beyond severe headaches she had no neuropathic affections.

The following cases are worthy of attention, as they ended in complete recovery of the mental derangement :—

A girl, whose father was a drunkard and epileptic, had fits when three years old, from which she recovered, and grew up to the age of fourteen without any deficiency of intelligence or bodily disease. 'About this age the epileptic attacks again returned and became very frequent, when she passed by degrees into a fatuous state. Her gait became tottering ; often she was unable to sit up even in an easy-chair, and she even required to be fed. Sometimes she would wander about at night instead of sleeping, or fall into maniacal bursts of passion. After four years' illness she was admitted into the asylum under Dr Wiedemeister, of Osnabrück, where she passed her time in the compartments used for dirty and noisy patients. The fits were both severe and frequent, and she was treated with bromide of potassium and oxide of zinc. Little hope was held out of her recovery ; but after being a year in

the asylum, and five years ill with epilepsy, the fits began to be less frequent. In November her catamenia first appeared, and in December the last fit was seen. She began to do simple pieces of work, her strength revived, and her intelligence gradually returned, and on the 23rd of June 1872, after being three years in the asylum, she was dismissed, cured of imbecility and epilepsy. On her returning to the world, it was found that she had forgotten many things which she had once learned. She had again to be taught to sew and knit. She had entirely lost the use of speech; even during the period of her deepest fatuity she used to sing songs which she had learned in the school, generally with the proper tunes; and when she was again sent to her lessons, it was found out she had not entirely forgotten reading and writing. During her fatuous condition she was not able to recognise her mother, and on her recovery she had entirely forgotten that her mother had pigs and cows; nor did she recognise her native place, nor even her home, when brought back to it.

Schroeder van der Kolk* gives an instance of a lad of seventeen, who was nearly idiotic from frequently recurring attacks of epilepsy, who recovered after incisions being made in the scalp, and issues being kept up. 'His mental powers, although not greatly developed, were remarkably improved; writing, arithmetic, etc., progressed satisfactorily; while he had a situation in a factory. The only peculiarity he manifested was pretty constant irritability of temper. It was, however, extremely important that from time to time, instead of an attack, hæmorrhage took place from the wound, with the effect of greatly clearing his head.'

The lad remained for eighteen months free from epileptic fits, when he died of consumption. 'From this case,' observes the distinguished Dutch pathologist, 'it is particularly clear

* *On the Spinal Cord and Medulla Oblongata and on Epilepsy*, Sydenham Society, London, 1859, p. 272.

that idiocy, or apparent dementia, after epilepsy, is quite a different disease from dementia after idiopathic mania, which always depends upon degeneration and atrophy of the cortical substance, and is incapable of cure.'

Post Febrile Insanity.

Parents are apt to attribute a change in the mental condition of their children to an attack of fever, scarlatina, whooping-cough, or typhus. This appears sometimes to be the case, probably often under a hereditary predisposition.

Dr Gerlach * has described insanity following scarlet fever in a girl ten years old. It was ushered in by fits and loss of consciousness, after which there were great excitability, hallucinations of sight and hearing, verbigeration, destructive tendencies and dirty habits. The child used to whirl herself about. She recovered after being thirteen months in the asylum. The author considers the insanity due to toxic products in the blood following nephritis.

Dr Brasch † showed a child of about four years of age who had scarlet fever. She was unconscious for some days. On coming out of this she could not speak, though she understood everything. This aphasia lasted for about two months, after which she slowly recovered speech. In this case there never was any albuminuria nor paralysis.

Dr Kelp ‡ describes a girl, six years of age, who was admitted into an asylum, suffering from mania with convulsions, and complete aphasia. Though unable to utter a syllable she could move the tongue and lips with ease. She passed into a shy, tearful condition; the symptoms of insanity soon disappeared; but she had again to go through

* *Allgemeine Zeitschrift für Psychiatrie*, Band xlviii, Heft 6, and *Neurologisches Centralblatt*, No. 18, 1892.

† *Centralblatt für Nervenheilkunde*, 1896, Juni.

‡ *Zeitschrift für Psychiatrie*, Band xxxi, Heft 1.

the process of learning to speak like a little child. In five months she was dismissed, when she could speak fluently, though somewhat slowly.

Dr Kühn* describes two cases of mental derangement promptly following diphtheria. In the one, a girl of twelve years, it took the form of acute stuperose dementia succeeded by epileptiform attacks passing into chorea. In the other, a boy of eight, the mental affection was of a hysterical character, with somnolent tendency, and refusal of food, which he took secretly.

Dr Meschede, of Schwetz, gave a case of insanity occurring in a girl of five years and nine months old. She had been quite healthy up to the fourth year of her life, after which she had intermittent fever. At the close of the fifth year she suffered from whooping-cough, which lasted for fourteen weeks, and was accompanied by frequent bleedings at the nose. Soon after, the first symptoms of mental derangement were observed. She complained of sudden feeling of cold or heat in the head, and this was soon succeeded by hallucinations of vision, hearing, and common sensation. She said she saw her playfellows appear at the window to strike her, saw bread lie upon an empty plate, and believed that her food contained injurious substances. She complained that her other sister, who was three years old, had affronted and spoken ill of her; that she had thrown a piece of wood after her, and had stuck it in her nose, and had struck her with a whip. She complained that her mother had put things in the bed which made it uncomfortable, and said that worms were crawling upon her eyes and hands. She was often in a state of terror that some one would come to steal her and her sister, and would not be appeased until her mother had locked the doors.

These paroxysms occurred with intervals of sanity, and

* *Centralblatt für Nervenheilkunde*, November 1897.

were not accompanied by any symptoms of fever or inflammation. After a time, however, an attack of eclampsia supervened, which was succeeded by cerebral congestion, ending in death.

Toxic Insanity.

In the epidemic of ergotism caused by the use of spurred rye in the food of the inhabitants of Frankenberg in 1879-80, described by Drs Siemens* and Tuczek,† many children were affected, and some of them became insane. Dr Tuczek did not find hallucinations common; but the children affected by the ergotism did not make any accurate distinction between their dreams and the observations of their waking moments. He gives the case of a little girl of seven years of age who had eaten of the diseased rye. She had epileptic fits, became very talkative and restless, spoke to every one whom she saw, told absurd stories, laughed and made faces, was passionate, danced about, wept, and showed other signs of great excitement. Recovery took place in some cases; in others the children sunk into idiocy or dementia. Dr Tuczek observes the symptoms of insanity from ergotism have a close resemblance to insanity from epilepsy. The character of the fits was the same, *grand mal*, *petit mal*, intervals of rest, pre- and post-epileptic delirium, benefit from bromides; all found in both. The lesions in the brains of those who died were not of a distinctive stamp, but the root zone or columns of Burdach in the spinal cord were found affected, corresponding to the failure of the patellar reflex.

Insanity, generally taking the form of melancholia with a tendency to suicide, is known to follow the use of ill-ripened maize. It is accompanied by heightened patellar reflex with

* *Archiv für Psychiatrie*, Band xi, Heft 1 and 2.
† *Ib.*, Band xiii, Heft 1, and Band xviii, Heft 2.

lesions in the lateral columns of the spinal cord. We are told that children are not exempt from this form of mental disorder; but in what proportion they suffer is not known to me. Dr Moreau observes that many children are affected with pellagra; but of these affected by this form of intoxication no more than from 5·5 to 11 per cent. have been found to be troubled with pellagrous insanity.

Illustrative Cases.

K. C.; father considerably older than the mother, who was about twenty years of age when K. C. was born. Mother a sensible woman, careful and attentive to her children. K. C. was the second child. The eldest a boy; brothers and sisters all healthy. She had no fits at teething. When five years old she fell ill with fever, delirious, screaming at night; increased heart-beat and bleeding at the nose. After this she was sometimes moody and irritable, and took paroxysms of violent screaming. She was fitful and capricious; appetite poor. She gave up taking milk, refused butcher meat, and showed a craving for things generally thought indigestible; when in good humour she would eat like the rest. She was taught by a governess up to nearly ten years, and was for her age a good reader, writer, and arithmetician. She also possessed an unusually large store of general information. Her noisy fits became more and more frequent, and her education had to be stopped. On one occasion she commenced a loud wailing at church.

An aunt, who said it was 'all temper,' took K. C. to her house and tried to subdue her by cold baths and other disciplinary methods. After nine months she was returned to her mother much worse. When K. C. was committed to my care she was eleven years and nine months old, pale, and small of her age. Her head was about the usual size. The pulse was soft and weak. She had a systolic murmur,

loudest at the apex, indicating mitral insufficiency. She used to take fits of wailing, which sometimes lasted for hours, till her voice became faint, and the sounds died away through sheer exhaustion. She used to get below a bed and hold on to the footpost, making the whole house to resound with her cries. Sometimes she would bump her head against the wall or floor, but as I noticed that she did not seriously hurt herself, I let her do so without interference, when she soon stopped. These fits of excitement were accompanied by a violent beating of the heart which was audible to one standing near. It could be seen thumping against the walls of the chest. Owing to her agitated movements it was impossible to count the beats, but they were very rapid. This was sometimes accompanied by bleeding at the nose. In mitral insufficiency the pulse is small, the arteries do not receive their full share of blood, and the tendency is towards depression and sadness. When the balance of mental health has been overset, a marked inclination to melancholia has been observed;* and Dr M. C. Girandeau has described some cases of mitral stenosis in young men accompanied by hemianæsthesia and hysteria, which seem to indicate a connection between the two diseases.†

* See Mickle, *On Insanity in Relation to Cardiac and Aortic Disease and Phthisis*, p. 29, London, 1888; and Victor Parant, 'La Folie chez les Cardiaques,' *Annales Médico-Psychologiques*, Mai 1889.

Dr Savage writes: 'I have been impressed by observing many cases suffering from mitral disease also being subject to melancholy.' See paper on 'Cardiac and Vascular Diseases in Insanity,' by Dr J. M. Keniston, in the *Journal of Nervous and Mental Disease*, February 1896, New York. In the May number of the same periodical there is a clinical 'Report of Three Cases of Insanity of Childhood,' by Dr Thomas L. Wells. One of these, a girl eleven years old, had a mitral regurgitation murmur, believed to be congenital. She was self-willed and difficult to manage, refused food, used to laugh without reason, then remained silent for months. Had hallucinations of smell and sight. Recovered under treatment.

† 'Rétrécissement Mitral et Hystérie chez l'Homme,' par M. C. Girandeau, *Archives Générales de Médecine*, November 1890. Girandeau describes four cases of hysteria in young men in whom there was also mitral stenosis. During two

One evening she made the house so uncomfortable with her loud wailing that I carried her into a cottage within the grounds and put a nurse beside her. She resisted this vigorously; but the idea that she had been put out of the house because she had rendered herself intolerable seemed to make an impression on her mind. I found that the wailing might be stopped by diverting her attention to something new. In time I got more expert at this process, and the effect was sometimes wonderful. When a wailing fit came on I would take her to chase a hen out of the garden, or get her to weed a bit, and once commenced, the action turned her thoughts into a new channel. On one occasion, when she was at her noisiest, we came to a ladder against the high wall, when I said, 'Run up that ladder and see what Mr So-and-so is doing. I want to know.' The little creature went slowly up the ladder, looked over the wall, and said there was nobody there. She came down the ladder, put her hand in mine, and walked round the garden with me. The paroxysm was over. When an outburst came on after dark it was a more serious matter, as it was difficult to divert her attention. At ordinary times she was gentle and timid, but pettish and easily offended. In a week K. C. had begun to improve. Her health became stronger, and the mental distress passed slowly away, the outbursts recurring now and then, but less noisy and less prolonged. After she had been about fourteen months under my care, I told her mother that she might take her away, as she was now free from any mental derangement; but her mother retained so lively a memory of 'her tantrums' that she was afraid to do so, and

years he met with eight cases of mitral stenosis, and three of these were accompanied by hemianæsthesia with or without hysterical attacks. From the association of other abnormalities, the author thinks the cardiac deficiency in these three patients was congenital and related to the hysteria. Taking eighty-four ordinary patients, Girandeau found that in only three of them there were derangements of sensibility.

the girl remained with me another seven months. K. C. herself looked back upon her performances with shame, and was by no means anxious to go back to her brothers and sisters.

During the farther time she was with us she was anxious to be helpful in the house, pleased to run on little errands, and desirous to go on with her education. She acquired or re-acquired arithmetic, which seemed to have passed away from her mind. She showed a persistent desire to learn to play on the piano, although she did not appear to have much natural taste for music. She displayed ingenuity in contriving and making ornaments out of the sea shells which she picked up on the shore, and in dressing dolls, and in general she showed that quiet and docile intelligence often seen in girls somewhat weakly in health. After she left us we had several letters and messages, which showed that her recovery continued.

Dr Savage * has published the case of a boy, eleven years old, who became affected with hysterical insanity after attending the funeral of his sister, who died of an accident. He pretended that he did not eat nor pass anything, but would steal food and eat it on the sly, and throw away his motions. He used to hide his face and scream for hours together, pretended that he could not walk, drew up his feet, and when forced to stand, rested on the outer malleoli ; was able to ride on a pony. He was sent to Bethlem Asylum, where he recovered, 'under judicious neglect and shower baths.'

In the prognosis of insanity in children much depends upon the nature of the causes and the extent and duration of the morbid processes. It has been laid down by Morea,

* *Journal of Mental Science*, p. 201, July 1885. There is a description by Dr Roller of a case of hysteria following meningitis spinalis in a girl of ten.—*Allgemeine Zeitschrift für Psychiatrie*, Band xlviii, s. 424.

that where there is no hereditary tendency in an attack of delirium or acute insanity the prognosis is favourable; but where there is a morbid heredity the hope of recovery is much less, and at any rate we may safely say that where there is a hereditary tendency there is a great danger of relapse in after life. In traumatic insanity delirium after lesions of the head may pass away; but injury to the intelligence and character noticed to come on later is likely to be more enduring. In a few cases improvement has followed operative treatment. We might expect that in toxic insanity the prognosis would be better on the principle *sublata causa tollitur effectus*. Dr Tuczek,* following up his admirable researches on the Insanity of Ergotism, has made a review of the condition of his former patients seven years after the epidemic of ergotism in 1880. The results, as often happens when experience corrects our hopes, are somewhat sombre. Out of a total of 29 admitted into the Asylum of Marburg, 9 were dead. Only three were certainly known to be wholly unaffected in mind; all of these were adults when admitted. Of the children treated for insanity, two, aged fourteen, were said to be normal, but were not seen by Dr Tuczek; three had suffered much in intelligence, and two had died of convulsions. In none of these cases had the patellar reflex returned. Where the mental deficiency was enduring it did not appear to be progressive.

A large proportion of the cases of insanity are complicated with epilepsy, and we have thus, in forming a prognosis, to consider what hopes we have of treating this difficult malady. The great danger of insanity in children is idiocy or dementia. It is rare for a child to recover even from a short attack of melancholia or mania without some weakening of the mental faculties, and the earlier the age the greater the danger. As

* 'Ueber die bleibenden Folgen des Ergotismus,' *Archiv für Psychiatrie*, Band xviii, Heft 2.

far as my knowledge goes, mostly all cases of mania in children, apart from the delirium of encephalitis, subside without ending in death from exhaustion.

Treatment.

I have found arsenic a favourite remedy with medical practitioners in treating insanity in children. Perhaps it has gained that reputation by being often effectual against the associated chorea. It is stated that Indian hemp has been found useful against the restlessness which accompanies insanity in children. Where the mental disorder is connected with epilepsy, the usual treatment against that malady should be pursued. In cases where the insanity was of a hysterical character I have employed with advantage monobromide of camphor, turpentine in doses of 15 minims, and tincture of the hydrochlorate of iron. I place most trust on diet, regimen, training and exercise.

CHAPTER XIX.

THE SENSORY AND MENTAL DEFICIENCIES OF IDIOTS.

THE essential deficiency of idiocy consists in want or hebetude of the intellect, not in imperfection of the senses. Nevertheless, as we have seen, the want of two or more of those senses most employed in perception, sight, hearing, and touch, produces a result closely resembling idiocy. A being destitute of touch, sight, and hearing, though possessing a brain well developed, could scarcely arrive at the conception of his own personality, or that his body was separate from the outer world, nor could he so connect himself with the outer world as to show anything beyond the vaguest mental manifestations. He would therefore be regarded as an idiot. Indeed, in the old times uneducated deaf-mutes were treated by the law as idiots, and without education a deaf-mute in many things resembles an idiot. The senses in idiots often share more or less the deficiency of the nervous centres.

Touch.

The sense of touch is often imperfect, but, from the mental dulness, it is difficult to ascertain the nature and degree of the imperfection. Direct experiments, such as noting the distance at which the two extremities of a pair of compasses can be distinguished as two and not one impression being applied to the skin, would be of little use here. Idiots cannot be taught to take enough of interest, or pay enough of atten-

tion to sensations of this kind; and their replies to questions would be of little value. In the idiotic we do not meet with that total want of sensibility to pain which is not unfrequently observed amongst the insane; but it is certain that idiots often endure with indifference blows and other injuries which would be very painful to an ordinary person, and they occasionally scratch or cut themselves in a way which no one would do who had the feeling of pain ordinarily following such injuries. We have a boy in the house who pulls out his hair when anything annoys him. He will even seize hold of a person's hand, and guide it to his head, apparently to get his hair pulled without personal exertion. Not long ago I saw a woman who said her daughter seemed deficient in the feeling of bodily pain. 'How do you know that?' asked I. 'Because,' answered she, 'if I beat her, she does not seem to mind; but if she loses anything she begins to cry.' An epileptic idiot once got a severe burn with nitric acid, which he took almost with indifference. In this boy the feeling of pain appears decidedly dull. A powerful application of the induced electric current seems to cause him no great uneasiness, but he can distinguish rough cloth from smooth by feeling it with his fingers, and his sensibility to heat appears to be normal. We read of idiots sleeping without cover in the open air, as if they were insensible to cold; others appear to be indifferent to warmth, not drawing near the fire in cold weather. The Report of the Sardinian Commission states that cretins are frequently insensible both to cold and heat. Stahl* remarks that they generally endure cold and heat without being much put about.

It seems to me that observers occasionally fail to allow for

* 'Gegen äussere Eindrücke sind sie ziemlich unempfindlich; so ertragen sie Hitze und Kälte ohne besondere Belästigung.'—Beitrag zur Pathologie des Idiotismus Endemicus gennant Cretinismus, in den Bezirken Sulzheim und Gerolzhofen in Unterfranken des Königreichs Baiern, von Dr Karl Stahl bei der Akademie eingegangen den 18 März 1843.

the slowness of idiots to resent external impressions. We see some sane individuals show their feelings of pain or pleasure in a very lively manner; others much less so; nor can we always put this down to mere difference in degree of sensation.

Selecting some cases in our Institution, we tried to test their sensibility to heat by immersing their hands in warm water, but found that they always withdrew them when it became unpleasantly hot. They did not seem able to endure a higher temperature than I could myself. This was true even of those who seemed indifferent to knocks and cuts, and who were believed to be deficient in tactile sensibility. Scaliger long ago remarked that in paralysis, heat is felt after the power of apprehending gravity is gone. In many cases general sensation is low. They seem to feel little pain at the extraction of a tooth, or punching out a stump, or the opening of an abscess. I have known a genetous idiot pull the nail of his big toe clean away, apparently without any suffering.

As is well known, in lesions to the nerves, loss of motor and sensory power generally go together, though sometimes they occur separately. It has been noticed by military surgeons, who have an opportunity of observing those random vivisections of nerves which are occasionally made by the bullet or the sabre, that sometimes motion is destroyed without sensation, or sensation without motion. The remarkable manner in which the sensory functions of wounded nerves are restored before the motor power, has been explained by Dr S. Weir Mitchell 'as being due to the constant automatic exercise of the sense of touch, whereas the function of motion demands a distinct volition.' This is perhaps the reason why a defective grasp is more common with idiots than a defective sense of touch. Where the grasp is firm and the fingers can be readily moved, yet the patient cannot put in a button nor

hold a needle, we are inclined to put it down to deficient tactile sensibility; but when the grasp and motion of the fingers are feeble and trembling, we attribute it rather to want of motor than of sensory power. Abnormal sensations, so common with lunatics, are not often met with amongst idiots. I had one instance where a strong healthy girl persisted for several days in the statement that there was something sticking in her throat, and I was obliged to give her chloroform in order to ascertain whether anything was really there. Nothing was found, but I told her that I had taken the thing away, when she seemed satisfied, and complained no more about it.

Seguin gives two cases where tactile sensibility was obtuse in every part of the body save the soles of the feet. Sometimes particular spots are noticed to be extremely sensitive. A girl, a genetous idiot, showed almost no feeling when pricked on the temples and scalp, but she resented pricking on the nose and fingers. We have in the house an epileptic idiot, in whom there is little difficulty in ascertaining that sensibility is much less keen in the trunk and limbs than in the head. If pinched or pricked on any part below the neck, he shows very little uneasiness; but if the same thing is done to the cheeks, or if the hair be pulled, he expresses pain in a lively manner. He uses his lips and tongue in feeling, instead of his fingers. When anything puts him about he almost immediately vomits; desire for food is very keen, and difficult to satisfy; and we had a girl—a congenital idiot—in the Institution, aged ten years, whose thirst was so inordinate that she would drink almost any kind of liquid in enormous quantities. She has been known to empty a ewer full of water in a short time. This abnormal thirst lasted for the five years she was in the house, and was noted on arrival. It is unaccompanied by diabetes. Dr George Brown, of Barre, Massachusetts, told me that he had a pupil under his care who seemed to be a parallel to this girl.

Sight.

The visual apparatus of idiots is generally good. According to Guggenbühl * this also holds true with the cretins, amongst whom he laboured. I have failed to observe an unusual number of either short or long sighted cases amongst my pupils, and I have been able to satisfy myself of the occurrence of but few cases of colour-blindness. Guibert and Schleich, who have made special studies of the vision in idiots, state that they have found hypermetropia to be common. Pigmentary retinitis has been sometimes noticed, and this at least injures the sense of vision. Disorders of the motor powers of the eyeball, like nystagmus and squinting, are very common. Dr Guibert observes that the eye escapes the influence of morbific causes which affect the brain, because it is fully formed at an earlier period of fœtal life.

The retina and the optic nerve grow from the anterior encephalic vesicle; they may be regarded as a portion of the brain thrown off early and developed more quickly. The crystalline lens is formed about the fourth week and the choroid fissure closes about the seventh week. The eye of the new-born child is only a few millimetres smaller in diameter than that of the adult. It is hypermetropic.

Malformations of the iris which give an irregular form to the pupil are not uncommon with idiots. They do not seem to affect the sight. Blindness sometimes occurs in idiocy: if congenital, the result of cerebral hæmorrhage; if acquired, the result of scrofulous inflammation.

* *Die Cretinen-Heil Anstalt Auf dem Abendberg*, von Dr Guggenbühl, Bern und St Gallen, 1853, p. 90. 'Der beste Sinn ist fast immer das Auge.' Foderé (*Traité du Goître et du Crétinisme*, Paris, an. viii) says, § lxiv, 'Le seul sens de la vue parait intact; mais qu'importe s'ils voient, ils n'aperçoivent pas.'

Doctors Rösch and Krais in their study of the children in the *Mariaberg* observe, 'Auch das Gesicht ist bei den meisten gut.'—*Beobachtungen über den Cretinismus eine Zeitschrift herausgegeben von den Aerzten der Heil Anstalt Mariaberg*, Tübingen, 1850, Erstes Heft, p. 12.

Hearing.

Deafness frequently occurs in families where some of the other members are idiots. Sometimes idiots are born deaf. We had an instance in the house of a boy who was almost totally deaf—the external auditory meatus of both ears ending in a blind pouch, about an inch from the outer opening. Loss of, or diminution of, the sense of hearing is often the result of hydrocephalus and scarlet fever, and sometimes of epilepsy, which are also causes of idiocy. Scrofulous ottorrhœa is common with idiots, not unfrequently causing dulness of hearing from destruction of the membrane of the tympanum, but rarely entire loss of hearing.

Taste.

A large number of idiots are deficient in taste; some of them seem to want the sense altogether—at least, one may make bold to say that a boy who would eat black soap cannot have much of the sense which constituted the main enjoyment of Apicius. Idiots seldom have the same objections as other children to take medicines. They will chew pills in their mouths, in a manner which makes one sick to look at; and I have seen two boys who positively seemed to enjoy turpentine, very likely because the strong stinging taste aroused their dull gustatory nerves. It is only the more intelligent class of idiots who notice any difference in the flavour of articles of food. They generally eat what is put before them, but sometimes refuse to take particular articles. Some idiots cannot be kept from eating grass or offal, or even more disgusting substances. In about eighty cases which we carefully examined, taste was found to be very deficient in twenty-two. They swallowed, without any apparent uneasiness, tincture of ginger hot enough to be painful to an ordinary

palate. Six more appeared to have the sense of taste deficient, though in a less degree; and very few of them seemed to possess anything like a delicate palate. Some would lick salt but not snuff; others preferred snuff, and would drink ammonia. Some liked quinine but disliked ginger; others would swallow anything with complacency. M. Bourneville * mentions one called Becco at the private Institution at Gentilly, who had a most insatiable voracity, and ate all kinds of husks and offal. His food was cut in pieces for him, but he made no use of his teeth, swallowing everything with the greatest rapidity. 'About an hour after,' writes M. Bourneville, 'he might be seen in a pleased condition, his face radiant with joy, chewing the pieces of meat which he had swallowed, and which had come back from his stomach almost unchanged. Every day, at different times, the same thing went on. It was one of the best instances of rumination in man which could be seen.'

Sense of Smell.

The boy who ate black soap and swallowed the hottest tincture of ginger without any remark, seemed also to want the sense of smell—at least he did not seem to find the fumes of strong liquor ammoniæ in the least annoying. This was also the case with a girl, who does not appear to want the sense of taste. Both were congenital idiots, but were capable of expressing their feelings. It is almost impossible to say how far idiots may be wanting in the delicate perception of odours. The sense of smell is too feeble in the human species to arouse a sluggish apprehension. As a general rule, it may be said that idiots want the sense of smell much less often than the sense of taste. They are pleased with sweet odours, and dislike pungent ones. They rarely use the sense of smell

* *Mémoire sur la Condition de la Bouche chez les Idiots :* Paris, 1863.

to distinguish the quality of food. Dr Rösch * says that the sense of smell is the weakest of all with idiots, and seems to fail entirely with many of them; and cites two instances where the olfactory nerves were found to be small in idiots who died at the Mariaberg.

It is true, as he says, that they manifest little dislike to bad odours, but the nose soon becomes accustomed to foul smells, and idiots are generally too indolent to exert themselves to remove a temporary annoyance.

Mental Symptoms.

No amount of skill in the diagnosis of pathological conditions can dispense with the careful analysis of the existing mental powers. On the other hand, by ascertaining the amount of intelligence, we can form some notion as to the amount of the nervous or cerebral lesion. An experienced observer can generally, on a single examination, assisted by parents or friends, gain a pretty correct estimate of the amount of intelligence possessed by an idiot. It is more difficult to find out whether he is educable or not.

The distinction between idiocy and dementia, which occasionally have a superficial resemblance, has been already stated. It is not likely that idiocy will be confounded with other forms of insanity. In mania and melancholia the patients show energy and passion wanting in the feeble caste of idiocy.

Dr Abercrombie, in his well-known book on the Intellectual Powers, thus writes: 'There has been considerable discussion respecting the distinction between insanity and idiocy. It has been said that the insane reason justly on false premises, and that idiots reason falsely on sound pre-

* *Beobachtungen über den Cretinismus, eine Zeitschrift herausgegeben von den Aerzten der Heil Anstalt Mariaberg*, Tubingen, 1850, Erstes Heft, p. 13.

mises. This does not seem to be well founded. It would appear that a maniac may reason either upon false or true premises; but that, in either case, his reason is influenced by distorted views of the relations of things. The idiot, on the other hand, does not reason at all; that is, though he may remember the facts, he does not trace their relations. Idiocy appears to consist, in a greater or less degree, in a simply impaired or weakened state of the mental powers; but this is not insanity. On the contrary, we have seen that, in the insane, certain mental powers may be in the highest state of activity—the memory recalling things long gone by; the imagination forming brilliant associations; every faculty in the highest activity, except the power of tracing correct relations.'

Esquirol takes speech as the criterion of the mental capacity in different idiots. In the first degree of imbecility, speech is free and easy; in the second degree, it is less easy and the vocabulary smaller. In the first degree of idiocy proper, the idiot can only use short words and phrases; idiots of the second grade only utter monosyllables or cries; in the third grade, they neither use speech, nor phrases, nor words, nor monosyllables.

We might divide idiots, from their mental manifestations, into—

I. Those who can receive sensory impressions, or *φαντάσματα*; who have sensations which they do not reduce to perceptions. They possess only the passive intellect (*νοῦς παθητικός*) of Aristotle and his commentator Averroes.*

II. Those who have also the power to compare, reason upon, and draw general conclusions from the *φαντάσματα*; who have the active intellect (*ποιητικός*).

* *Averroès et Averroïsme*, par Ernest Renan; Paris, 1861; § v, p. 123. *Aristot. de Anima*, L. iii, cap. v.

III. In the third grade they can form abstract ideas, though slowly and with difficulty. They have a weak capacity for tracing causations, are deficient in synthesis, and never gain more than a superficial knowledge of the relations of things. This class includes all higher degrees of idiocy.

For the purpose of education I divided the pupils into five grades :—

I. Comprising those who can neither speak nor understand speech.

II. Those who can understand a few easy words.

III. Those who can speak, and can be taught to work.

IV. Those who can be taught to read and write.

V. Those who can read books for themselves.

I find that most cases can be put under one or other of these classes. Where there is a difficulty it is generally with the third class, for some can speak who cannot be taught to work, though very few.

Apart from abstractions, a ready standard to measure the capacities of idiots is got by comparing them with those of ordinary children at a given age. We can say that an idiot has the capacity of a newly-born child. It is scarcely necessary to go further back than this ; but, as you all know, there are some creatures for which we must go back to the fœtal condition, acephalous monsters, in whom the medulla oblongata is present, and who can thus breathe, suck, and even be made to cry. These creatures generally die, in the first week, of convulsions. But, to go on, we may say the idiot has the intelligence of a child of so many months, or so many years. Idiocy, in its mental manifestations at least, may be viewed as a fixed infantile condition. Idiots remain all their lives children in intellect ; often so in their feelings and desires.

Of course there is always this difference between an idiot and another child, that though at a given time the potential intellect of the one is no greater than that of the other, the idiot has the benefit of a larger experience. Nevertheless, we must have some scale of comparison, and if we reject this one we are not likely to have any other.

The human body, it ought to be remembered, is an extremely complex machine. At birth the mind of the new being is put in possession of five senses, as means of ascertaining the changes of certain forces or certain properties in the material world, and 265 pairs of muscles, which, made to contract by an effort of the will, enable the new being to execute a variety of motions. Not only are the senses at birth not arrived at perfection, but a long process of spontaneous education is needed, and a number of inferences are made and tested, ere information derived through sensation is of practical value.

But as has been already noted, whole areas of the brain are at the time of birth still in an incomplete state of development, and not only are the senses not arrived at perfection, but a long process of spontaneous education is needed, and a number of inferences have to be made and tested ere information derived through sensation is of practical value. Taste seems to be exercised at once along with the muscular action of sucking ; the tactile sensibility of the tongue and lips is delicate, the infant rejects changes in the taste of its food, and dislikes cold. The new-born child dislikes bright light, and shuts his eyes to it. After the first week he turns to the blaze of a lamp, and during the second week his eyes will follow it attentively. The cornea is but little sensitive to touch during the first two months, a condition which sometimes persists with idiots. At the end of a month or six weeks an intelligent child will recognise his nurse by a smile. New-born children are quite deaf, the tympanum and the

meatus are filled with mucus, and the fibres of the auditory tract developed, last of all the sensory nerves.*

During the third month babies begin to notice noises, and in the fourth month to distinguish particular sounds, after which they begin to recognise voices and to distinguish those of different persons around them. Sir William Wilde observes that from the fourth to the sixth month is the earliest period when an opinion can be formed as regards the hearing of an infant; but the idea of deafness never having presented itself, it is seldom until after the twelfth month (unless there are other mutes in the family) that the parents or attendants begin to perceive that the child does not hear.

A healthy child when two months old can lift up his head, and in the third month he begins to use his hands. The first voluntary co-ordinated motion seems to be grasping an object and putting it into his mouth—this comes very early. About the ninth month be begins to push his feet against the ground and wave his legs; he generally begins to walk from the twelfth to the eighteenth month. The first appearance of speech is variable: words generally come from the first to the second year, but if the child is mute after two years we may suspect there is something deficient.

Such is the ordinary course in healthy infancy; but with idiots this evolution of the senses and motor powers is much slower, and often irregular.

* Donders observed an infant a few minutes after birth who fixedly regarded an object held before it. When the object was moved from side to side the infant followed it with both eyes; when the object was held nearer, the convergence of the eyes was increased, and when it was removed farther off, the convergence was lessened.—*Archiv für Ophthalmologie*, Band xvii, 1871, p. 34. But during the first weeks squinting is not uncommon with infants, especially in looking at near objects.

See also *Aural Surgery and Diseases of the Ear*, by William R. Wilde, F.R.C.S., London, 1853, p. 460.

Darwin observed that his infants started at sudden sounds when under a fortnight old.—*Expression in Man and Animals*, p. 39. This is, I think, unusually early. However, it is admitted on all hands that some children are earlier, some more backward, than others.

Some can scarcely be brought to suck at all, though others do so without difficulty. The child does not notice things, smile, or stretch out its hands to grasp them like other infants. Idiots of the lowest class seem to have nothing more than the passive intellect: the optical apparatus of the eye are perfect, but if the creature apprehends the sensation of light, it does not use it as a perception; or perhaps it only notices a sudden flash of sunshine, or the difference between day and night; or perhaps objects swim before its eyes like the waves in the sea, so confused and unnoticed that it can scarcely be said to see at all. Vibrations enter the ear and set in motion its complicated machinery, but the idiot heeds it no more than the miller does the sound of his mill. It is sometimes very difficult to find out whether an idiot is not actually deaf, who nevertheless can hear perfectly well if the attention be caught. Sometimes he will only show that he hears loud, abrupt noises, or certain musical notes, or particular sounds, such as the jingling of keys or the deep tone of gongs.

Itard remarked of the wild boy of Aveyron, who turned out to be an idiot: 'When, without his knowing of it, I plucked, in the most cautious and gentle manner, a chestnut or walnut, —when I only touched the key of the door which held him captive, he never failed instantly to turn back, and run towards the place whence the noise arose. If the hearing did not express the same susceptibility for the sounds of the human voice, for the explosion even of fire-arms, it may be accounted for from that organ being little sensible and attentive to any impressions except those to which it had been long and exclusively accustomed.'

As regards the perception of sensation, the idiot may be somewhat in the condition of a man half asleep, or heavy with extreme fatigue, or on the verge of fainting, or deeply intoxicated. The sluggishness of idiocy may be occasionally

owing to all efforts of attention being painful, so that impressions are allowed to wander through the mind without any attempt being made to fix or examine them.

One occasionally sees idiots who have been kept alive for many years, and would die of starvation unless food were put into their mouths. There are idiots who may be said to have grown up in bed, who have never walked nor left the supine position, and cannot grasp or execute any voluntary motion save opening and shutting the mouth. I have seen another idiot, seven years old, who only swallowed food when placed on the back of the tongue within reach of the reflex actions of the pharynx. He was kept tied in a chair; for, though unable to design any motion, he would sometimes make involuntary bounds, which would throw him on the floor.

Dr Jules Voisin easily exposes the hollowness of Seguin's definition that idiocy is an infirmity of the nervous system, which withdraws all or a part of the organs and faculties of the child from the action of the will, delivers it to its instincts, and cuts it off from the moral world. He justly remarks that it is not the will which is absent, but it is the perceptive centre which is diseased: it is the want of intelligence which is the prime deficiency. The want of power over the muscles observed in some idiots has been regarded as owing to the absence of the conative faculty or will; but it is not clear to me if those who are satisfied with this explanation distinguish nicely enough between the different mental processes required for the accomplishment of a voluntary act. We must first have knowledge, the knowledge of the object desired, and then the desire put forth in overt exertion to obtain a known object, or to change one state for another, which is quite different from the pain and pleasure obtained, when by the exertion of the will the object is gained. The quiescence of idiocy may be owing to the want

of knowledge requisite to form a definite desire, to the callousness of feeling through which pleasurable emotions cannot be reached, as well as to the want of will or desire to obtain by exertion a known object.

Nevertheless there are cases of apparent special default of volition. Dr Parrish describes some such observed by him, in terms which seem unequivocal. 'A boy,' he says, 'for example, who is hungry or cold, whose instincts prompt him to seek food or fire, will do neither voluntarily, for want of the power to determine to do it; but will suffer for hours together the conflict between his natural cravings and his want of will to indulge them; but, when once moved from his seat by the touch of another, will seek, find, and appropriate what he needs. He will not play in the gymnasium, even when his muscles quiver with the native impulse to engage in sport, *for want of power to start*, but when once moved and directed, is cheerful and happy. The want of volition is the ever-present barrier to his improvement.' Sometimes the defective power, wherever it lies, can be brought into exercise by careful training. The teacher grasps the arms of the pupil, making him perform passive exercises, until in time he is led to exert himself to continue them. Here it is either the passive movement of the limbs, which, by exciting a pleasurable sensation, puts into the mind of the idiot the desire of reproducing it by muscular efforts, or the enforced exercise which calls into activity the dormant powers of the will. In any case the usual order is reversed, in accordance with a principle indicated by Laplace* in his *Essay on Probabilities*:—'The principle of the connection of all the things which in an internal organ have had an existence either simultaneous or in regular succession, a connection which by the return of one thing recalls the others. To this fruitful

* *Essai Philosophique sur les Probabilités*, par M. le Comte Laplace; Paris, 1816, p. 227.

principle are related a large number of phenomena as well as the following principle. *If one frequently performs the actions which result from a particular modification of the internal organ, their reaction upon that organ may not only increase that modification, but sometimes give birth to it.* Thus, the movement of the hand which holds a long chain suspended is propagated through the whole length of the chain to its lower end. But if, the chain being at rest, one puts the lower end in motion, the vibration mounts upwards to the hand, making it move in its turn. These reciprocal movements become easy, and, as it were, natural by frequent repetition. This facility that the internal organ contracts is another principle of intellectual physiology.'

Instances of astonishing strength of the will are not uncommon. A girl of twelve years of age wishing to attain any object generally exerts her whole muscular strength, which for her age is very great. If denied a thing she wants within her sight, she will rush at it with the most extreme eagerness in her countenance; the tears start to her eyes; she struggles, pulls, and kicks, but without ever saying a word, for she is mute. She is very fond of pencils, and an attempt being made to deprive her of one is resisted with her usual determination. Once, when I had occasion to give her chloroform, on her becoming unconscious I took away her pencil, which she had still clasped in her hand; but she noticed the want of it immediately on returning to consciousness, and looked round about her in search of it, with a distressed and anxious expression.

In normal infancy the use of the muscular apparatus is only gained in a slow and tentative manner. The child learns by degrees to grasp, and that if it relaxes its grasp for a moment the object will escape it. It learns to turn its eyes towards objects, to raise its hand to its mouth, to push, to creep, and to walk. This requires mental effort and attention,

as much as learning to ride, to skate, or to drive a velocipede; and as there are some people too stupid to learn to do these well, there are beings too stupid to learn how to use the machinery of the body properly. In general idiots or imbecile children are awkward in their motions and slow at learning to walk. Out of 111 cases of which I have the report, the average time before the child began to walk was $2\frac{1}{2}$ years. In making up this average, all cases where idiocy had commenced after the child had learned to walk have of course been omitted. Only five were stated to have begun to walk at one year. No doubt the cause of this lateness in learning to walk is in some cases owing to weakness, in others to nervous disease; but there are still cases where the child always appeared strong and healthy, and the deficiency is really in the power of mental guidance. Their gait, too, is awkward; they learn to walk in the easiest manner, which they never try to alter or improve. Idiots in general have a bad balance; and if this be tested by causing them to walk along a plank, it will be found that it is the most intelligent who succeed best. The same awkwardness applies to the hand—it is flapped or vibrated about instead of being employed to seize or obtain an object.

In some inquiries about left-handedness* I found in an ordinary school that the number of left-handed children was about the same as in the school for idiots at Larbert, that is, about 12 per cent.; but in the ordinary school the children could all be passed as either right-handed or left-handed; whereas amongst the idiots there were about 15 per cent. who used both hands indiscriminately, so that it was impossible to state that they were either right or left-handed. Where the tendency to left-handedness is not very decided the habit of preferring the left hand is generally broken by

* See my 'Notes on Left-handedness' in *Brain*, July 1880, and paper 'On Mirror-writing' in *The Blot upon the Brain*, Edinburgh, 1893.

education, but idiots are much more intractable. The same tendency to ambidextrous use has been observed with the criminal class. Mirror-writing has been found more common with imbecile children who use the left hand,—that is, the tendency to trace the letters from right to left centrifugally. This kind of reverse writing is most easily read by looking at it in a mirror.

The following passage from Carpenter's Physiology * is no more than the statement of a notion very widely diffused. 'Those unfortunate beings, in whom the cerebrum is but little developed, are guided almost solely by their instinctive tendencies, which frequently manifest themselves with a degree of strength that would not have been supposed to exist; and occasionally new instincts present themselves, of which the human being is ordinarily regarded as destitute.' As an instance of this he gives: 'A perfectly idiotic girl, in Paris, having been seduced by some miscreant, was delivered of a child without assistance; and it was found that she had gnawed the umbilical cord in two, in the same manner as is practised by the lower animals. It is scarcely to be supposed that she had any idea of the object of this separation.' I am not aware of any facts which confirm this statement. My impression is that instinct is often weaker in idiots than in ordinary children. The action of sucking, for example, is generally regarded as instinctive; but it frequently happens that born idiots cannot suck at all, or require to be fed artificially for some time ere they learn to suck,—in fact, there is reason to believe that the spinal cord, the seat of such reflex actions, is often diseased in idiocy as well as the brain.

As for the story of the idiotic girl in Paris, I know not on what ultimate authority it rests. I have witnessed the birth of a child from an idiotic woman in a lunatic asylum, and can testify that she showed no desire to gnaw the umbilical

* *Principles of Human Physiology*, fourth edition, p. 773.

cord. She seemed quite unconscious of anything but the pain of parturition. The labour pains being feeble, she had in the end to be delivered with the forceps. Her breasts were not much enlarged, and the maternal feelings seemed to be very slightly, if at all, excited. The infant did not appear to me to be an idiot.

It is common enough to say that an idiot has less intelligence than some of the lower animals. Nevertheless, when we come to compare the intelligence of the one with that of the other, we soon become aware of the difficulty. One reason undoubtedly is, that whether an animal may be said to act by instinct or by intelligence, all his mental operations have one turn—providing for himself, for his kind, or performing some action to which he has been trained by long habit. Rousseau observes all the lower animals have exactly the faculties necessary to preserve them; man alone has superfluous ones; and this is generally true, though it does not hold good in all cases. An animal deficient in the faculties of its kind must perish. In fact there are idiotic animals—idiotic pups, for example, as dog-breeders know, which are of course destroyed whenever their deficiency is recognised. In idiots some of the superfluous faculties remain weakened like the rest, but still there, to distinguish the intelligence as of human type. An idiot who can be taught to read may be utterly unable to preserve or defend himself.

The word instinct is often used as if we could create a difference between our own mental operations and those of brutes, merely by giving a different name to the same thing. There is no ground for reasonable doubt that the higher class of animals, such as the elephant, the dog, and the monkey, have mental faculties differing in degree, and to some extent in kind, but still essentially of the same class as the human intellect. They not only observe objects and note their changes, which implies apprehension, memory, and compari-

son, but they can carry on simple processes of reasoning, can understand and occasionally try to communicate information. We have no proof that they comprehend the relations of numbers, or can form abstract ideas. Every one has heard a good many anecdotes about clever dogs and sagacious elephants; and the intelligence of the anthropoid ape is all the more remarkable that the structure of his body and his tendency to imitation make him the caricature of man. Most of the larger apes can be taught to use the knife and fork. Some have been taught to light a fire and make coffee. M. Dureau* had the pleasure of knowing an ape who conducted himself at table as well as an ordinary Frenchman. He was invited to dine by a rich bourgeois, and M. Dureau assures us, 'sa tenue de rigueur n'eût rien laissé à désirer.' I have been much struck with what is told of the wolverine or carcajou in an amusing book of travels.† 'During the winter months,' we are told, 'this animal obtains a livelihood by availing himself of the labours of the trapper, and such serious injury does he inflict that he has received from the Indians the name of Kekw-aharkess, or the "Evil One." With untiring perseverance he hunts day and night for the trail of man, and when it is found, follows it unerringly. When he comes to a lake, where the track is generally drifted over, he continues his untiring gallop round its borders, to discover the point at which it again enters the woods, and again follows it, until he arrives at one of the wooden traps. Avoiding the door, he speedily tears open an entrance at the back, and seizes the bait with impunity; or if the trap contains an animal, he drags out, and, with wanton malevolence, mauls it and hides it at some hole in the underwood, or at the top of some lofty pine. Occasionally,

* Most of these statements are taken from the *Bulletins de la Société d'Anthropologie*, tomes iv and v.

† *The North-West Passage by Land*, by Viscount Milton and Dr Cheadle; London, 1865, pp. 102-105.

when hard pressed by hunger, he devours it. In this manner he demolishes the whole series of traps, and when once a wolverine has established himself on a trapping walk, the hunter's only chance for success is to change ground and build a fresh lot of traps, trusting to secure a few furs before the new path is found by his industrious enemy. Strange stories are related by the trappers of the extraordinary cunning of this animal, which they believe to possess a wisdom almost human.'

Even supposing these stories to be sometimes exaggerated it is clear that the wolverine possesses reasoning faculties much greater than what we are generally willing to allow to the lower animals.

Most idiots that pay any attention to sound have got some ear for music. Many can hum tunes correctly who cannot speak a word and cannot even understand speech. Sometimes we have pupils who use the voice to imitate tunes, though they cannot be induced to use the voice to repeat words in order to communicate their feelings, desires, or thoughts, nor even to repeat words like a parrot. Such creatures sometimes show an extraordinary eagerness to listen to music. Some who can only repeat two or three words will employ them in various modulations to sing or chant a tune. In general idiots prefer easy music, but then their ear has seldom received much culture. Some sing very correctly, and have sweet voices. On the whole, it appears that though destitute of other æsthetic feelings, in the mere taste for music idiots are little behind ordinary children. This is a subject of frequent remark amongst the parents of such children, who are apt to ground hopes upon the special gift, which are seldom destined to be realised.

One may discern traces of the musical faculty in those rhythmical movements to which idiots of the lowest class are addicted, rocking their bodies, and keeping time by whistling

or emitting uncouth sounds. The germs of the musical faculty are no doubt deeply rooted in the human organism, and of all talents that of music is the most apt to be transmitted by heredity. A family taste for music even descends to idiots. I had under my care a boy of nine years, capricious and resistant, who never could be got to put on his clothes; he remained obstinately mute, only now and then uttering a word or two, mostly under the influence of excitement. He was fond of music, and could hum four or five tunes, singing the words of a verse here and there, or when someone else was singing he would join in with a few words and go on singing. Among the songs which he thus sung in part were 'I'm off to Philadelphia,' 'The Boatie Rows,' and 'She is my Annie, I am her Joe.' All attempts to get him to speak the words without singing were in vain. The power of musical performance sometimes escapes in insanity. It seems to me that the musical faculty is localised in both sides of the brain, and that it may still survive after extensive injuries to the brain, which have impaired or destroyed the more complex mental capacities.*

If imbecile children are slow at learning to walk, they are still slower at learning to speak. The lower classes of idiots never learn to speak at all. Out of 103 cases of which I have notes, 36 were found mute on entry, and 67 could speak more or less. The average time at which they began to speak was four years and three months. Only 4 were noted as having begun to speak at one year. Sometimes they began to speak as late as ten or twelve. All these children could hear. It may be said of the greater number that the reason why they could not speak was that they had no ideas to express.

In watching the evolution of speech in children we do not find that every percept or concept, every recognition of an

* See my paper on 'The Affections of the Musical Faculty in Cerebral Diseases' in the *Journal of Mental Science*, July 1894.

object or of a quality is speedily fitted with a word. Before the child begins to speak he has observed and generalised, and understands much of what is said to him. There is an accumulation of ideas before words well out from the lips. Words are used to indicate conceptions here and there; evidently there are wordless connections of thought between. A large number of idiots remain mute simply because their ideas are too rudimentary to need expression. They often understand a good deal of what is said to them without being able to speak. An imbecile may distinguish colours without being able to name them, desire things without being able to ask for them, and know all his companions without being able to call them by name.

Some writers have called attention to what they style echo language, the parrot-like repetition of a few phrases. This does now and then occur with idiots—in fact it does so with normal persons; but what has struck me much more deeply is the general truth, which I have verified through twenty years passed in daily intercourse with such children, that *when idiots use words they do not use them through mimicry of sound, but to signify ideas; they either speak with a meaning or not at all.* This is all the more surprising that apparently the vocal apparatus of many mute idiots seems perfect and they have an ear for music. If they were to catch up words and phrases like a parrot there would be endless chattering, but this is not so.

Take the case of the small-headed idiot whose portrait is given in figure 6, page 140. He had some ideas, could understand simple observations or directions, and was a cunning and expert thief. He was much given to mimicry. I tried to teach him to speak; he imitated every gesture and motion which I made, but never a word came. I had under my care for many years, a girl, paretic on the left side; she had a nurse constantly with her, but had only been heard to

utter three words. I held out a cat to her, when she looked at it and said, 'cat'; another time a horse passed, when she said, 'horsey,' and once in the bath she said, 'Oh, dear!' An idiot boy saw some meat on the table and said, 'beef,' the only word he had ever been heard to utter. Another mute of low intelligence who could not be taught anything was asked what he would like, when he said, 'cake,' quite distinctly. I could give other instances of idiots using words at intervals of years, and always with a meaning. How different it is with a parrot! I have kept for four years a macaw, a fine bird, intelligent too, he sups with a spoon, and though injured in the wing so that he cannot fly, can climb a tree with beak and claw. I have heard him repeat above fifty phrases, including many words, but he does this out of sheer mimicry, often reproducing the tone and accent. When the humour is upon him, he repeats his words in no apparent order, but he does not try to express ideas or to name objects, using such terms as, 'hurry up,' 'come on,' 'be quiet,' 'take a bit.' I cannot convince myself that he uses any words with a meaning save 'apple,' which seems to stand for all kinds of food, and 'cold,' probably a new sensation to a bird from the forests of Guiana. He expresses his emotions by screaming, not by words. This gift of imitating sounds belongs to some persons, but it is not speech, though it may be exercised through words.

Though in idiocy the gift of speech bears a pretty well-marked relation to the number and complexity of ideas, there is a small class who may be styled idiotic aphasics who remain obstinately mute, though it is clear they have more intelligence than other children who talk volubly—sometimes, indeed, they have so much intelligence that people doubt whether they are imbecile at all. Those instances which I have seen all appeared to me to be imbecile children. If they were not so they could be educated at a deaf and dumb school to

express themselves by signs and writing, and might be expected to surpass deaf-mutes, having the great advantage of being able to hear and understand speech. In fact I have seen some of these mutes in schools for the deaf and dumb, but none of them making much progress. Sir William Wilde * has given seven instances, selected from the Irish census of 1851, where there was mutism without deafness or imbecility. In some of these cases the informants or reporters hesitated to assert decidedly that there was no deficiency of intellect; but in none was the intelligence so low as in any degree to account for the mutism. In most cases there was more or less want of power over the muscles of the tongue. Here is an example. Dr Walsh, of Ballinakill, afforded the following return upon the case of a man aged twenty:—'He is completely dumb, seemingly not capable of giving expression to even inarticulate sounds; his hearing is acute and correct, and he is in no way guided by observing the lips of the speaker; he is an intelligent, well-formed agricultural labourer; his tongue appears shorter than natural, and he cannot protrude it beyond the lower lip, but can move it from side to side with freedom; he has no cerebral disease.'

I know an instance of a boy who, although he cannot speak ordinary words, yet has invented a few of his own to which he attaches fixed meanings. Thus, he says 'weep-oo' for night and black, 'Kuss-kuss' for his brother John, 'hurly' for wood or for a carpenter; he calls another brother 'Gildy-googli,' and 'tutteras' soldiers; 'hubba' big or large; 'goodies' old women, 'gildy-goldies' young women. Some words are from the sound made by the objects, as 'teuch-teuch' a railway train, 'hee-ho' a horse, and 'ba' a sheep. The only words he uses in their proper sense are 'yes' and 'no.' Idiots who are able to speak generally confine their remarks to the expression of simple wants and feelings. They prefer short

* *Op. cit.*, pp. 465-7.

words, and truncate the long ones. If asked to repeat several words, they often repeat only the last one, or even the last syllable.

It not unfrequently happens that idiots cannot pronounce particular sounds or letters, or can pronounce them only in particular combinations. They often substitute one letter for another. One imbecile female, aged twenty-three years, cannot pronounce P, T, and K, using in their places, B, D, and G, the sounds which require an adjustment of the muscles of voice most nearly resembling the letters she cannot imitate, B and P being formed by approaching the lips, D and T being formed by approaching the tongue to the arch of the palate ; G and K are gutturals. In B, D, and G, the mouth is closed and opened more slowly than in P, T, and K, in which the action of the lips, tongue, and throat is more abrupt. This woman has the upper alveolar ridge so prominent that the lip does not stretch properly over it. It is often a difficult question whether these deficiencies in pronouncing certain sounds are owing to paralysis of different nervous filaments or motor centres of nerves, the remains, perhaps, of more extensive paralysis or nervous weakness. In some instances this is no doubt the true explanation. We had, for example, a boy aged thirteen, partially hemiplegic, who was utterly unable to pronounce K at the beginning of a word, and sounded the letter G imperfectly. This was owing to deficient power in the muscles of the uvula and soft palate. On being asked to pronounce K with the mouth open, the uvula could be seen to be drawn to the side opposite to that on which the arm and leg were paralysed.

We have a child thirteen years of age who only began to speak when about nine years old. At present, though possessing more intelligence than many children who talk volubly, he cannot pronounce many sounds, such as K, Th, B. He

always substitutes T for K, and P for B. This boy has a slight paralysis of the left side of the face. We have many other children who cannot pronounce particular sounds, in whom no other muscular deficiency appears to exist. There are, however, pupils in the house, who have special deficiencies of motion in the arms or legs, which appear at gymnastic drill.

One difficulty in regarding these as cases of deficient pronunciation appears to me that most of the muscles used in speech are the same as those used in chewing and swallowing the food; and if we assume paralysis in the one function, how do we account for it not taking place in the other? We know that in labio-glosso-pharyngeal paralysis, which has generally been found to be associated with disease of the pons or of the corpora olivaria, the power of swallowing is impaired along with that of speaking. This consideration appears to me not without weight; but it ought to be borne in mind that the articulation of words demands a much finer adjustment of the muscles than in moving the lips or swallowing, and that a loss of power over the muscles generally commences with difficulty or hesitation of the speech before any other motions are affected. This is well known to be the case in drunkenness and general paralysis of the insane. Stammering consists in the momentary inability to pronounce a sound or to connect it with other sounds, and is owing to deficiency in the co-operative power of the larynx with the movements of the mouth; but though stammering may be associated with chorea of other muscles, it often exists with perfect command of the rest of the muscular system.

Max Müller remarks:* 'There is one class of phonetic changes which take place in one and the same language, or in dialects of one family of speech, and which are neither

* *Lectures on the Science of Language*, by Max Müller, M.A., &c., London, 1864, p. 176.

more nor less than the result of *laziness*. Every letter requires more or less of muscular exertion. There is a manly, sharp, and definite articulation, and there is an effeminate, vague, and indistinct utterance. The one requires a will, the other is a mere *laissez-aller*. The principal cause of phonetic degeneracy in language is when people shrink from the effort of articulating each consonant and vowel; when they attempt to economise their breath and their muscular energy.'

This species of indolence is very common with idiots. They alter difficult sound for others which they can pronounce more easily, miss out articles, and shorten words; the tendency being to reduce all words to one syllable.

A singular analogy may be found between the aberrations of idiots from common speech, and those which time has brought about amongst peoples who once spoke a common dialect, as in the Aryan and Semitic families, each from a separate *Ursprache*, and the better-known example of the derivation or corruption of the different Romance languages from the Latin. It appears, as Max Müller argues, that in the end we must come to a physical explanation in the structure of the organs of speech. Certain races prefer certain sounds, because they can utter them more easily; and this must be referable to a facultative difference of nervous or muscular energy giving greater or less power to particular muscles, so that some modifications of the expelled air of the chest are more easily made than others by the majority, and consequently such-and-such a pronunciation is preferred. In this way whole nations have given up using sounds common in the language of others, just as idiots avoid or cannot pronounce certain sounds.

The Latin *aqua* became *agua* in Spanish, *eau* in French, and *apa* in Roumanian. From the same root the Romans formed *sto*, the Greeks ἵστημι. Many nations find it difficult

to begin a word without a vowel, and so the Welsh changed *schola* into *ysgol*, the French into *école;* the Spaniards in Peru said *escola.* The Hindustanis always say *ischool*, *istable* when they have to use such words. The Chinese have no R in their language; the Mexicans had no B, V, F; the six nations amongst the American Indians have no labials. The Arabians have sounds which we can scarcely imitate in their *khe* and *ghain.* The people of the Society Islands, in trying to pronounce Captain Cook's name, said *Tute*, exactly what several of our children would say. In like manner, I could find counterparts to many of these linguistic variations in cases of idiots, who in speaking interchange certain letters or sounds.

Since writing this passage twenty years ago, I have found that a similar view was suggested by the great German philologist Jacob Grimm,* who supposed that there must be some difference in the anatomy of the vocal organs of peoples according as they are rich in sibilant sounds, or use hard or weak gutturals. It may be here observed that what Max Müller would call the more manly style of pronunciation, in which the consonants and gutturals are strongly uttered, is thought the best pronunciation in Germany, whereas in the British Isles the broad and strong pronunciation used in the North is not so fashionable as that in the South, in which some of the gutturals disappear and the aspirates are neglected. In fact our spelling is a monument of a manlier pronunciation from which the English have departed.

The easiest abstract ideas are those where sensible qualities of matter are separated in the mind from the concrete objects to which they are attached, as in the notion of hardness or resistance, which is combined in the mind with that of shape or figure and colour, which also comprises two qualities, for the idea of colour cannot be separated in the human mind

* *Kleinere Schriften*, 'Ueber den Ursprung der Sprache,' Band i, 1864, p. 267.

from that of extension. Sometimes they can be taught to distinguish forms before colours, sometimes the reverse. Many idiots can be taught to distinguish colours who cannot be taught to name them. They can learn to thread beads of different hues without making any mistakes in the selection. In naming them, black and white are generally first learned, then red and yellow. According to Sir John Lubbock, some savage tribes who have names for different colours have no word for colour in general.

The idea of number is taken up with great difficulty, number being a purer mental abstraction than colour or form. The deficiency of idiots in this respect is certainly very striking. Take the instance of a boy aged ten years, who knows all the colours, and is learning the alphabet. He forms an estimate of the character of those around him, and has some sense of moral relations. He talks volubly on childish subjects, but is so deficient in arithmetical power that a year ago he seemed to have no conception even of a unit. He would say that he had three heads, touching his head several times with his finger. This was not because he wanted the word, for he could repeat the names of numbers, as far as twelve at least, without any difficulty. This year, after much trouble, he seems to have mastered the idea of two, and can count cautiously up to three. When he gets to four he is extremely perplexed. If one holds out five fingers to him, he will count 'one, two, three, four—there is four,' or at another attempt, 'one, two, three, four, five, six, seven,' and the sum total is declared to be eight. This boy is not without imagination. He is fond of arranging pebbles in a line to represent a railway-train, showing he can conceive of symbols. I never met with a single case of an imbecile who was expert in figures. Such cases are described, but they are very rare; even those who can read tolerably are deficient in arithmetic. To teach them to count at all, even on the abacus

or bead-frame, is a matter of great difficulty. With an amount of trouble which would be enough to form a senior wrangler out of an under-graduate, they may be brought to learn a little addition, subtraction, and multiplication, but very few can be taught division. When one sees the amazing results which can be worked out by turning the handle of a calculating machine, long columns of figures added, subtracted, multiplied, and divided with unfailing accuracy, it is difficult to understand how a being who shares an intelligence, small indeed, but essentially human, should take years to learn to add together a few figures, and even after learning them should be slow and unwilling to apply his knowledge. Dr Abercrombie,* who had detected this weak point in imbeciles, gives the following example, in which it was used for a test for imbecility:—

'A gentleman of considerable property having died intestate, his heir-at-law was a younger brother, who had always been reckoned very deficient in intellect, and consequently his relatives now brought an action into the Court of Session for the purpose of proving him incompetent, and obtaining the authority of the Court for putting him under trustees. In the investigation of this case various respectable persons deposed that they had long known the individual, and considered him as decidedly imbecile in his understanding and incapable of managing his affairs. On the other hand, most respectable evidence was produced that he had been, when at school, an excellent scholar in the languages, and had repeatedly acted as a private tutor to boys; that he was remarkably attentive to his own interest, and very strict in making a bargain; that he had been proposed as a candidate for holy orders, and, on his first examination in the languages, had acquitted himself well; but that, in the subsequent trials, in which the candidate is

* *Intellectual Powers*, pp. 354-356.

required to deliver a discourse, he had been found incompetent. The Court of Session, after long pleading, decided that this individual was incapable of managing his affairs. The case was then appealed to the House of Lords, where after further protracted proceedings, this decision was affirmed. I was well acquainted with this person, and was decidedly of opinion that he was weak in his intellect. At my suggestion the following experiments were made in the course of the investigation:—A small sum of money was given him, with directions to spend it, and present an account of his disbursement, with the addition of the various articles. He soon got rid of the money, but was found totally incapable of this very simple piece of arithmetic, though the sum did not exceed a few shillings. This individual then, it would appear, possessed the simple state of memory which enabled him to acquire languages, but was deficient in the capacity of combining, reflecting, or comparing. His total inability to perform the most simple process of arithmetic was a prominent characteristic in the case, analogous to what I have already stated in regard to the cretins. In doubtful cases of the kind I think this might be employed as a negative test with advantage, for it probably will not be denied that a person who is incapable of such a process is incompetent to manage his affairs.'

Ordinary children can rarely learn counting till they are five or six years old. The lowest savages, such as the Australians and Polynesians, have no words for numbers above three or four; after this they say a hand for five, two hands for ten, a man for twenty. This is evidently the origin of the decimal method of counting, as counting by scores arose from counting both the fingers and toes.

If you ask a Greenlander the number of people about, and he wishes to say fifty-three, he will say the third man on the third foot, *i.e.*, he counts the fingers and toes on three men

till he comes to the number three on the first foot of the third man.

There is something in the nature of our conceptions of numbers, and the manner in which in arithmetical calculations we can shift from ideas to words, and from words back again to ideas, which arrested the wonder of the first Greek philosophers. Pythagoras speaks of numbers as if outward objects were copied from them. He said 'the wisest of all things is number, and next to number that which gives names.'

Æschylus * makes Prometheus say that he discovered to men numbers, the chief of wise devices—

> Καὶ μὴν ἀριθμὸν ἐξοχον σοφισμάτων
> Ἐξηῦρον αὐτοῖς, γραμμάτων τε συνθέσεις,
> Μνήμην θ' ἁπάντων μουσομήτορ' ἐργάτιν.

Dr Wilbur † gives a curious instance of an idiot, ten years old, who could obey a few simple commands, and had learned the names of a few familar objects. He was being taught the first ideas of number. 'Our custom,' says Dr Wilbur, 'is to begin this before the names of the numbers are imparted. He was taught to string black and white beads alternately, then in pairs, and so on up to fours and fives, where the exercise is dropped, to be resumed again when the names of numbers have been learned. He, however, had fallen into the hands of a new teacher, who, not understanding the matter, had continued the exercise. I found him one day, to my surprise, stringing thirty-five black and white beads alternately. I found, on still further examination, that up to this point it was only necessary to indicate any number, by first placing them on the string, and then he would continue to alternate the required number without mistake.

* Prometheus, *Desmotes*, l. 459.

† I take this from a pamphlet on Aphasia, by Dr H. B. Wilbur, Superintendent State Asylum for Idiots, Syracuse, N. Y., p. 29.

'My first thought was, in the absence of the power of counting, he was enabled to do this by measuring on his string the alternate distances accurately. I found, however, that owing to a marked difference in the size of the beads, these did not correspond at all. I have no explanation to offer for this mental operation, but it seems to me that number was comprehended to the extent mentioned, without language.'

The boy must have had some image in his mind whereon to rest his counting. The conception in number implies *as many as*—as many as the fingers of the hand or the dots on a domino. Often concrete images enter into the arithmetical workings of ordinary minds, as Galton has shown.

It might be thought that since arithmetic was so late in appearing in ordinary children and so deficient in imbeciles, that it would be one of the first faculties to disappear in the downward process of dementia; but as far as my experience goes this is not so. In a number of patients suffering from progressive dementia and general paralysis the arithmetical faculty did not seem to be more impaired than other faculties; indeed, it seemed as if they were less so. Patients so far gone in dementia that they could not, or would not, take the trouble to select or put on their own clothes, nevertheless added columns of figures with tolerable accuracy, and correctly worked sums in reduction, proportion, or other ordinary questions in arithmetic.

In a case of general paralysis it was a contrast to see a man, after making the most senseless and immoderate boastings, sit down and work in a creditable manner a question in arithmetic. While all his conversation savoured of extravagant delusions, his arithmetical exercise was correct and neatly done.*

* See my paper 'On the Arithmetical Faculty and its Impairment in Imbecility and Insanity' in the *Journal of Mental Science* for July, 1891.

Sometimes the teacher in an idiot school finds that what he has taught his pupil is forgotten—fading gradually or suddenly away out of the mind. This is most common in epileptic idiocy after renewed fits; but occasionally it is noticed in other forms of idiocy, without any accompanying symptom. It may thus happen that the same lesson has to be taught three or four times over.*

Our description of the mental condition of idiots is but a series of negative definitions, and it would be both difficult and tiresome to pursue the subject much further in reference to the capacities of imbecile children who can learn to read and write, and understand some of the relations of number. These unfortunate creatures have a complete, though a weak, outline of all the human faculties. In their minds every species of mental operation is performed, though on a small and feeble scale, just as the child has all the muscles and nerves of the athlete. They fail in estimating the probabilities of daily life; they fail egregiously in self-knowledge. Fortunately for them they have seldom any idea of the gifts which nature has denied them. An imbecile boy would get on the back of a horse, which would hurl him to the ground in a moment; another, who can scarcely read, will ask to be educated for a minister; a third, who could not learn to take the change of a shilling, proposes to become a lawyer. One of our boys, who can read tolerably, go messages, make

* Mr G. E. Johnson has repeated some observations made by Galton on the memory of idiots. The pupils selected were able to read a little. The tests were the remembrance of a few figures repeated to them. He tells us that 'The results of the memory tests show that the feeble-minded fall considerably below normal children in memory-span. But the memory-span is so good in some cases, and the average for the majority is so high, that we are led to conclude that the degree in which the memory-span of feeble-minded children falls below that of normal children is not commensurate with the degree in which the feeble-minded fall below normal children in general intelligence.'—(See *Journal of Psycho-Asthenics*, December 1897, Faribault, Minnesota). As every teacher of such children knows, their memories are often very fleeting, but I have seen imbeciles now and then with unusually tenacious memories.

brushes, and other work, told me that he would like if I could get him to be either a clerk in the telegraph office or a railway signaller. This feature in their character has been finely touched by Madame de Gasparin in her pathetic story, *A Poor Boy*. 'However badly he might succeed, however little he might please others, he was no less in his own estimation—always the right man in the right place. It is true that when he took up a mug he might often chance to break it; if he moved a chair, it was a thousand to one but he let it fall; if he lighted the fire, he would be sure to blow the cinders into the porridge-pot; and when he tried to feed the cow, he would infallibly have put out her eye with his fork, had not the worthy animal, familiar with his ways from childhood, invariably turned away beforehand. Yet nothing daunted or dismayed him.'

In idiots the weakness is general and involves the whole mind. What teachers find most in their way is the difficulty in fixing their attention. One reason of this is that they have to direct the notice of their pupils to subjects above their ordinary range, just as it is more difficult to get people to attend to a mathematical demonstration than to a story. However, the powers both of voluntary and spontaneous attention are weak in idiots; almost all of them have an easy indolence, very wearying to those who have to set them at work; they need even to be incited to play. If you begin to put on a bandage on the hand of one of such patients, he will let his hand droop so that you need to support it as well as turn the bandage; if you tolerate this, you will presently have the weight of his whole arm; and if you do not protest, he will lean against you so that, if you withdraw suddenly, he is in peril of toppling over.

Imbeciles are generally credulous and often unsettled in purpose, have got little capacity for any abstract line of thought, and could not follow a complex chain of reasoning;

but I do not know of any power which existed in the mind of Shakspere or Napoleon of which they are totally destitute. They may have a poor judgment, a weak memory, a feeble power of comparison, a beggarly imagination, a fitful attention; but they do possess judgment, memory, comparison, imagination, and attention, in varying, though in meagre proportions; and all these can be educated and increased by exercise.

Often after having accumulated a considerable store of acquired knowledge, the original childishness remains, sometimes brought into ludicrous relief by the increased power of display given by education. I have seen individuals who had sufficient mental power to pass college examinations, take degrees, and even gain prizes, who were so manifestly unfit to conduct themselves in the ordinary affairs of life, that they were a laughing-stock to the most ignorant people around them. Most of the imbeciles described by Trélat in his striking book, *La Folie Lucide*, are simple-minded people, often with a tinge of insanity. Imbecile girls not unfrequently find husbands in France, where the marriages are arranged by the parents, and a dowry will make almost any young woman pass muster in the matrimonial market. I knew of an instance of the kind myself when living at Avignon. Trélat portrays, in an eloquent and touching manner, the misery of such connections, which often hand down the curse of imbecility or insanity to another generation. Dickens has, in *David Copperfield*, given a beautiful picture of an imbecile girl, whose tender and loving nature gained the heart of an inexperienced and imaginative young man. The imbeciles in Dickens' stories are obviously the result of real studies from nature; the pictures of Barnaby Rudge, Mr Dick, Miss Podsnap, and Maggie in *Little Dorrit*, are evidently done by an artist who has studied the class. In most other novelists the idiot seems to play the part of the jester in the Middle Ages, saying droll

things, and repeating scraps of poetry. There are some idiots who never cry or shed tears, but very few with any glimmering of sense who do not laugh. They often appreciate humour of a broad character, and enjoy a joke when they see it, though they seldom originate one. Their naïveté is sometimes very amusing.

B. D. spoke in a very stolid manner, never trying to be humorous, but almost everything he said had something droll in it. Once when he was in the hospital, I said to the sick-nurse, 'Give him a pill and a half.' He said: 'Oh, just mak it twae and a half, Doctor.' Another time he called to the nurse, 'Oh! Mary, give me some water to wash my mouth, and I'll give you it back when I am done with it.' Once when walking out with the teacher and the other boys, they came behind a very stout man, when Sandy, looking at his broad back, cried out in a very audible voice, 'Is that man square, or is he oblong?' at which the man turned round and looked at him in no amiable manner. This was the result of the figure lesson. He used to say 'Alexander is my right name; Sandy is my left.' He was much given to ask people to write down his name on a bit of paper 'in case he should forget it.' If they obliged him, he would make them add his father and mother's name, and so on. He was somewhat troublesome and aggressive, but the irresistible drollery of his remarks kept everybody in good humour. Sometimes the literal manner in which directions are interpreted by the simple-minded leads to whimsical results. An imbecile young man once called at a friend's house on a message. He stayed about four hours, walking about the room the whole time. When asked why he did so, he said, 'Thomas (his brother) told him not to sit down,' meaning, of course, not to stay long. On one occasion a boy asked me when he would get out of the hospital. I said, 'When the sore in his leg was filled up.' The next day he had the ulcer filled up with

bread-paste, and asked to be let out, for it was now filled up. He was anxious to get some more wood to cleave down for firewood, but I told him he must wait till what was already cleft was burned, on which he gathered all the wood into a heap, and was going to set it on fire in order to have it burned.

Once when some people were talking amongst themselves about a girl's grandmother, she cried out, 'I am sure I do not know whether my grandmother had any grandchildren or not.' An imbecile boy from the north had still something of the shrewdness and caution of 'canny Aberdeen.' I once said to him, 'Jamie, why do you not offer me a bit of your cake?' 'Because you would tak (take) it,' was the laconic answer.

At a scripture lesson, on reading the verse, 'Blessed are the peacemakers,' the teacher asked, 'Who are the peacemakers?' to which a girl replied, 'The bakers.' A weak-minded girl having cavities in her teeth, I took her to a dentist who put in metal amalgam in five teeth. Thinking her teeth were now of extra strength, she obligingly used them in cracking nuts for the younger children, and very soon made away with the stopping. The following illustrates their loose notions in arithmetic :—A girl being called a donkey, rejoined, 'A donkey has four legs, and I have only two.' A lad treasured up this reply, and sometime after he was called a goose, when he promptly answered, 'A goose has four legs, and I have only two.' On being asked, 'How many legs have the sparrows?' he said, 'They have no legs, they fly about.' Reading a history book about a king's forefathers, he said, 'I did not know one could have four fathers.' Being asked how he could be older than a baby whose birthday fell two days earlier than his own, he was much puzzled, but was not convinced that he was not the oldest. A boy who had been taught to read and write a little, took advantage of his accomplishments to fill in a printed order, sent by a wine merchant, which had fallen into

his hands, and then added, 'Please send the money along with the goods.'

Lunatics on the approach of death sometimes regain the even balance of their minds, as Blanche of Devon said—

> 'This hour of death has given me more
> Of reason's power than years before;
> For as these ebbing veins decay,
> My frenzied visions fade away.'

It occasionally happens that idiots under great excitement use words or express sentiments which nobody ever heard them say before. M. Nièpce, in a letter to the Academy of Sciences,* gave an account of a cretin who lived near the valley of the Isère. He was goitrous and scrofulous, did not walk till four years of age, and only spoke a few words, which he pronounced imperfectly. He was very apathetic, but sometimes showed a little liking for his mother. He was seized with hydrophobia, when he spoke with much greater facility than any one believed that he could do before the doctor and the apothecary, talked with great affection of his friends, and entreated them not to leave him alone. The day after he told them to call the Curé of the parish, and regretted with tears than he had never been able to learn the catechism. He died after four days' illness.

We meet with idiots and imbeciles of every kind of temper and disposition. Most of them are merry and good-humoured, completely free from care, and, if well treated, lead an easy and happy life. Some, however, are gloomy and irritable, though their resentment is little to be dreaded. We now and then hear of dreadful crimes committed by idiots; but this is generally because they have received no training, and have been exasperated by ill-usage. In their mental and moral qualities they resemble children more than lunatics, and, no doubt, children would do serious mischief if they had the strength of grown-up people, as idiots sometimes have,

* *Comptes Rendus*, 1853, p. 615.

and would come to do serious crimes if their education were totally neglected, as is so often the case with idiots. In general, puberty is late with idiots ; in most cases its manifestations are feeble ; in many cases it does not appear at all. But when it does come, it excites in the minds of idiots, especially when they are healthy and vigorous, desires and feelings unknown to children. Its arrival demands increased care, especially with females.

In the Report of the Commissioners in Idiocy to the General Assembly of Connecticut,* we are told that—

'In a neighbouring State, some years since, an idiot girl, being left alone with an infant, killed it by striking it on the head with a flat-iron. Since that time that girl has had the advantage of four years' instruction in an asylum for idiots. She is now nearly sixteen years of age, and a more gentle, kind-hearted creature does not exist. She has learned the history of the meek and suffering Jesus, and she seeks to imitate His example.

'In our own State, a vicious idiot, some years ago, killed a man who was working with him, by striking him on the head with a shovel. Another was guilty of a very heinous crime, the result of his ungoverned lust. Another still, under the influence of experienced and daring villains, aided in a scheme of robbery and murder. These poor imbeciles were unconscious of guilt in the commission of these crimes, but society was none the less the sufferer, and life and person and property were rendered insecure, because these poor outcasts had not been instructed and controlled in their youth.'

People who have to do with criminals have remarked a deficiency of intellect approaching imbecility, combined perhaps with a brutality engendered by low habits and an amount of cunning which the nature of their life renders necessary. Ordinary imbeciles, however, have few bad ten-

* Newhaven, 1856, p. 14.

dencies, though they are easily led away, and have no proper ideas of the distant consequences of action. I have known imbecile lads turned out of charitable institutions when their term was over, and, their parents failing them, who went about as tramps and beggars; but they were not taken up by professional thieves, as they were too stupid to be of use for their purposes. It is very rare to see an imbecile who is naturally malicious. The most striking instance that I ever saw was a boy who was also born deaf. When at home he used to beat his little brothers and sisters unmercifully. Once in the institution the governess received a violent blow on the back of the head, and on recovering from her emotion and looking round, she saw this boy sitting quietly a few feet behind her, quite immovable, but watching as usual with his dull grey eyes. He would occasionally pinch or prick the smaller children, especially selecting those who could not speak, but he did it rarely, and with great caution. His deafness, combined with imbecility, prevented him from learning much. When he returned to his own home he was not so easily managed. His mother assured me that he used to put skewers into the fire, which he intended to run into her.

Idiots are destitute of shame, and even imbeciles of a higher grade require to be taught lessons in decency. Their intellectual want much narrows the scope of their feelings and affections, but it may be truly said that idiots and imbeciles seem to be much more expert at taking up moral relations than one would suppose from their other deficiencies. They attach praise and blame to particular people and particular actions. They are accessible to pity, and still more so to affection. The better classes of imbeciles can often be induced to make considerable sacrifices for the happiness of others, giving away, for example, things which they like, and preferring the pleasure of seeing others enjoy them.

The distinctive features of the male and female characters

are observable among idiots. Female idiots are distinguished for their fondness for children, their love of finery, their greater gentleness, and more impressionable character. The lower class of idiots have no religion. Imbeciles can be taught the existence of a superior being, though their ideas thereupon are childish, and have a tendency to become anthropomorphic. Some imbeciles take up the notion of responsibility to a higher power, which distinguishes the religious man from the simply moral. They can learn the biographical and historical parts of Scripture, the precepts in the Gospels, and the parables; but it is vain to try to teach them doctrines such as those contained in the Shorter Catechism or Thirty-nine Articles, which they neither can remember nor comprehend. The following story is literally true:— A mother said to her imbecile boy, 'I fear I shall not live long, but I do not know what will come of you when I am dead, my son.' He answered, 'Will there not be a hole in the heaven, mother, through which you could see me?' The idea of death interests them; some of them are anxious to see the bodies of their companions who have died, and take an interest in funerals, but they are not afraid of ghosts or of being in the dark.

Special talents in idiots have excited considerable attention. It will readily be conceived that in training-schools they should have got a very careful cultivation, and while they have been cultivated the other faculties have been frequently neglected. Thus, the disparity between the special cultivated talent and the other faculties, which are not only weak but neglected, is made very striking. We have read of one Gottfried Mind, who was said to be a cretin, more or less imbecile. He was so skilful in drawing pictures of cats that he got the name of the 'Cats' Raphael.' He died at Berne in 1814.

Many of his drawings and paintings are to be seen in

picture galleries in England, Russia, and Germany. Pictures representing groups of cats are frequently sold for Mind's, which are only copies. Genuine Minds are very rare. There are instances of idiots of a low type who could be taught to draw correctly enough from a copy, but to paint even cats in different attitudes with skill and expression obviously requires the vigorous exertion of several mental qualities. It would be interesting to know the mental characteristics of this artist. If one considers that men of special genius are sometimes much behind other men in very commonplace qualities—of this Mozart is a striking instance—it will not be out of measure surprising that some imbeciles should be highly distinguished above other imbeciles by some special bent or talent. It strikes us that a constructive or mechanical turn is more frequently preserved amongst idiots than any other gift. Unless we are mistaken, this is also true of lunatics; for we have been several times much struck by seeing lunatics construct or invent machines requiring both thought and attention, who from their conversation seemed incapable of any consecutive mental effort. At any rate, there are idiots who have shown a remarkable aptitude for constructing articles in wood, for music, drawing, and even for arithmetic. Seguin, in his book on Idiocy, gives an account of a blind idiot who has a remarkable talent for playing on the piano, and for repeating tunes which he only heard once. Dr Trélat* tells us that they had in the Salpêtrière an imbecile born blind, affected with rickets, and cripple, who had great musical talents. Her voice was very correct, and whenever she had sung or heard some piece, she knew perfectly the words and the music. As long as she lived they came to her to correct the mistakes in singing of her companions; they asked her to repeat a passage which had

* *La Folie Lucide étudiée et considérée au point de vue de la Famille et de la Société*, Paris, 1861, p. 19.

gone wrong, which she always did admirably. In spite of this rare talent she seemed quite destitute of vanity. 'One day,' Trélat tells us, 'Géraldy Liszt and Meyerbeer came to the humble singing class of our asylum to bring her their encouraging consolations.' Dr Forbes Winslow* quotes a case of a man who could remember 'the day when every person had been buried in the parish for thirty-five years, and could repeat with unvarying accuracy the name and age of the deceased, and the mourners at the funeral. But he was a complete fool. Out of the line of burials he had not one idea, could not give an intelligible reply to a single question, nor be trusted even to feed himself.'

Griesinger† has noted a remarkable memory for places in idiots of a low mental capacity. This is also noticeable in horses. When Cardan‡ wrote that the horse surpassed man in memory, he must have referred to this particular exercise of it.

We have only two cases in the house of special talent: one is for drawing and carving in wood, the other is in a boy who pays special attention to the architecture and construction of the house. A boy at Earlswood is stated to have the gift of mental arithmetic. 'He adds together and multiplies three figures, by three figures, giving the product with lightning rapidity.' Mr H. G. Atkinson writes§—'I have seen an idiot woman with this faculty in excess, that her only delight when alone was to be occupied with questions of number.' Dr Howe says—'No. 225 has little use of language, his intellect is very limited, he is, to all intents, an idiot, yet he has an astonishing power of reckoning. Tell him your age, and he

* *Obscure Diseases of the Brain and Mind*, London, 1863, p. 586.

† *On Mental Pathology and Therapeutics*, translated by Drs Robertson and Rutherford, p. 371.

‡ "At cùm in cæteris animantibus et superior homine memoria sit velut in equis."—*Cardanus de Consolatione*, lib. ii, p. 35.

§ *Zoist*, vol. ii, p. 168.

will, in a very short time, give you the number of minutes.' Dr Guggenbühl tells us that in Salzburg there lived in his time a cretin of somewhat higher intellectual powers, who used to solve the most difficult questions in mental arithmetic with incredible rapidity. They wished to make him a teacher of arithmetic; but as he had never been taught himself, he could not make his methods of calculation intelligible to others. It is clear Dr Abercrombie's test would not apply to these cases; nevertheless such skill in numbers is extremely rare with idiots. These arithmetical imbeciles are the George Bidders and Zerah Colburns of their class. There is a man who is weak-minded or imbecile, who constructed an elaborate model of a ship, which is in the entrance-hall at Earlswood. I believe it was overmasted, and upset when put in water; but I saw him at work upon a model of the 'Great Eastern,' which he was building plank by plank in a correct and systematic manner.

Foderé, in his work upon Goitre and Cretinism,* speaking of cretins, remarks,—'Several of these individuals, endowed with so weak an intelligence, are born with a particular talent to copy drawing, for rhyme, or for music. I have known some who have learned of themselves to play passably well upon the organ or harpsichord; others who learned, without any master, to mend clocks, and to make some pieces of mechanism. That probably arises from a more perfect organisation of the organ on which such-and-such an art depends, and not on the general understanding; for not only are these individuals not able to read the books which treat of the principles of their art, but they are put out when one speaks about it, and never arrive at perfection.' Foderé, in these remarks, evidently refers to what he calls demi-cretins.

The observations of physicians in the derangement of functions which he meets with in disease have been of much service

* *Op. cit.*, § lxxii.

in building the science of physiology. Also the observations of alienists in the dissolution of the mental faculties attending insanity, have brought into relief many strange things in the nature of the human mind. Your professors of metaphysics and moral philosophy seem content to sit in their studies reading what has been already written, and making their pupils commit old definitions by heart. It is cheering to know that in Germany and in North America a new and vigorous psychology has arisen which has escaped from the formalism of the past, and which our philosophers in place will soon be forced to take up, were it only to preserve appearances. The teaching of idiots has given us an opportunity for the analysis of their faculties, in which we have the human mind reduced to a state of extreme simplicity. I think we might teach something to the psychologist and to the educator also, if we were fortunate enough to catch their not too willing attention.

CHAPTER XX.

ON THE BEST METHODS OF EDUCATING IDIOTS AND IMBECILES.

History.

In the seventeenth century St Vincent de Paul, amongst his many works of benevolence, gathered together a few idiots in the priory of St Lazarus, took charge of them in person, and attempted to teach them ; but his labours, though continued for years, do not seem to have been very successful. The first systematic attempts at the education of idiots may be said to have followed the first successful teaching of the deaf and dumb, prosecuted by Pereire about 1734-1780, and the Abbé de l'Epée (1770).

In 1818 the effort was begun, and continued for several years, at the American Asylum for the Deaf and Dumb in Hartford, to instruct idiot children, and their physical condition was improved, and some of those who were mute were taught to converse in the sign language. In 1828 a school for idiots was carried on for a short time by Ferrus and Leuret at the Bicêtre. In 1831 M. Falret attempted the same work at the Salpêtrière ; and in 1833 Dr Voisin organised a school for idiots in Paris. None of these attempts, however, met with sufficient success to insure their continuance. In 1835 Haldenwang, a clergyman of Wurtemberg, had a small institution erected for the training of idiot children at Wildberg. In 1841 Dr Seguin opened a school in the Hospice des Incurables de la Rue St Martin, and not long after the idiots

in the Bicêtre were placed under his charge. In 1840 Dr Guggenbühl bought the Abendberg, and the year after he opened an institution for the education of cretins; while much about the same time Saegert, then a teacher of the deaf and dumb in Berlin, began to take in idiots as pupils, and to study the subject. Guggenbühl's undertaking attracted great interest, and many distinguished travellers visited his beautiful mountain. Their favourable reports led to the foundation of charitable institutions for idiots in all the more advanced countries of Europe. The first training school in England was founded at Bath, 1846, by Miss White. An institution was begun at Highgate in 1847, destined, in the course of a few years, to expand into the great Asylum of Earlswood. The asylum at Baldovan, near Dundee, was founded in 1853 by Sir John Ogilvy, and the Gamle Bakkehus, the first Training Institution in Denmark, was opened near Copenhagen in 1856. This improvement in the treatment of idiots soon passed to the New World, and in no country did it take a more vigorous root than in the United States.

The Treatment should be both Mental and Physical.

Nowhere is the maxim of Pestalozzi truer than in the training of idiots: 'Nicht Kunst nicht Buch das Leben selber ist das Fundament der Erziehung und des Unterrichts.' Neither art nor book, but life itself, is the groundwork of education and teaching. To produce improvement we must act upon the whole being, upon the body as well as the mind, for idiocy or imbecility is not simply mental deficiency or inertness, to be removed or improved by a special course of teaching adapted to a low mental state, but a deficiency of nervous functional power, the result of various diseases of the brain and nervous system, and often associated with, and in some measure dependent upon, a feeble constitution. A

deficiency of mental power, though the most important symptom, is far from being the only one. Though no doubt the mental faculties in uneducated idiots frequently suffer from want of exercise, teaching alone, in many instances, would be attended with little or no benefit. In the feeble the tone of health is to be raised; in the scrofulous the constitutional defect is to be treated; in the epileptic we try to diminish the number of fits or to make them cease entirely. Each case must be separately studied and treated by hygiene and medicine as it seems to demand. In all, the bodily frame is to be invigorated by exercise. While this is being done the work of the teacher may go on parallel with that of the physician.

We have seen that in some cases extensive lesions or alterations in the brain have been discovered, in others the lesions seem only partial, while in others again nothing abnormal has been made out, though we may be disposed from analogy to believe that this is only owing to the imperfection of our means of investigation. It seems likely enough that in some cases, portions of the brain still remain healthy. We may therefore suppose that in idiots who improve under instruction, where the whole cerebrum is diseased, it in great part recovers its tone by being brought into healthy exercise, and that where a part still remains sound it is thrown into more vigorous exercise than the rest, attracts a greater supply of blood, and gains a more vigorous nutrition that the surrounding parts. We may fairly infer that the improvement will be influenced by three circumstances: the nature of the existing lesion, the possibility of ensuring that the brain will receive no further injury, and the propriety of the stimulus applied to the nutrition and function of the organ.

In writing on the training of idiots we cannot be expected to enter into the whole subject of education, which the instructor must learn from another source. All that can be

done here is to point out the difference between the training of idiots and that of ordinary children, and to indicate the kind of lessons which the teacher may find useful in giving. It must not, however, be thought that there is any set method or series of mental processes to which every idiot child should be subjected. If the teacher make all the pupils in one class go through exactly the same lessons, it is rather because he is compelled to do so, from the need of taking them all at once, than because he thinks proper that every child, however varying in taste and capacities, should have exactly the same kind of teaching. At any rate he can fairly assume that his pupils have all the normal mental faculties. But this does not hold good with the teacher of idiots, who has to deal with pupils not only of low but of very unequal capacities. He must therefore be able to form an estimate of the mental powers of his pupils and guess at what stage to begin, what faculties can be most readily called into cultivation, and what most require training and exercise. The difficulty of forming classes is very great in such schools. Age here is no test. The big are classed with the little, the young with the old. They are brought together for a few weeks on the footing of equal acquirements; but one learns quicker and leaves the other behind; one has greater capacity of attention, and can learn a longer lesson; a third makes no progress whatever in the same direction as his class-fellows, though, perhaps, he improves in some other respect; while more rarely a pupil falls back, and through fits, or some other nervous disease, requires a cessation of all attempts at education for the time being.

The Teaching must commence with very simple exercises.

It is scarcely necessary to observe that in a normal child there is a spontaneous evolution of the faculties, which commences almost from the day of birth. This process consists in observing its sensations and drawing inferences from them—

in fact, this is the whole sum of human culture; but as observations become more difficult and the inferences more complex and abstract, the art of the teacher has to be used to quicken, correct, and methodise the spontaneous activity of the growing intelligence. Even in an idiot this spontaneity must exist, for without it intelligence could not even commence to grow, or the first step in the path of knowledge be made. In the case of idiots many things have to be taught which an ordinary child would acquire of itself, or pick up with scarcely a conscious effort from its mother or nurse. The child may be unable to use the muscles of its body from several causes—from utter stupidity and incapacity to direct the complicated machinery of the human body, or from a deficiency of nervous or muscular power; and it is the duty of the medical superintendent to distinguish such cases. Even in early infancy idiocy may be often diagnosed from the slowness or awkwardness of the child's motions. If laid flat upon his face he will sink upon the floor, whereas a normal child of a few months will try to right itself or cry for assistance. Idiot children require to be taught to walk more carefully than other children; even after they have learnt to do so their gait is generally awkward, and there are many muscular motions of the arms and legs in which they are deficient, and some that they have never attempted.

It would seem at first sight that a private teacher, such as a governess, who had the entire tuition of an idiot child, would come to her task with great advantages on her side, as she could devote her whole time to one pupil; but, nevertheless, I do not remember ever to have heard of much being done in this way. Very likely she lacks the conviction, derived from experience or observation, that her efforts will not be thrown away, and the tact acquired by practice of getting round, past, or under difficulties. The influence of the mother under the same roof is often most unfortunate.

I have several times been consulted by governesses in the difficult and painful position of having undertaken the education of an imbecile child, whom the mother refused to admit as being wanting in intelligence. It may be doubtful whether it is a sadder sight to see the neglected idiot children of the poor or the pampered idiot children of the rich. Balzac, in his *Peau de Chagrin*, tells a striking story of a man who becomes possessed of a mysterious bit of skin. When he wishes for anything he is sure to obtain it; but the talisman turns smaller with each accomplished wish, and it is understood that when the skin is all shrunk away the man will cease to be. The unfortunate, who can obtain everything he desires save the severance of his fate from the mysterious gift which he has rashly accepted, tries by the most elaborately-laid precautions to anticipate every desire. His carriage is always waiting for him night and day; food is always ready for him; every want is supplied before it is felt. Something like this is done by indulgent parents to their idiot children, who imagine, perhaps, that by catering for every wish they can make up for the want of the intelligence which they are keeping enfeebled, or who dream that they can uphold the absurdest of all views of rank, the rank of an idiot; as if intellectual superiority were not the most decided of all superiorities, and a pauper idiot could not be educated to be the better of an uneducated idiot in a wealthy man's house.

When should the Special Training begin?

There is a period in an ordinary life when it is generally better that the teacher should succeed the mother in a part of the education of the child. This is also true with deficient children, only the teacher must do more for the child—be more of the mother, as it were, and more of the teacher too. She must teach it things which an ordinary child learns at

home. The general opinion of experienced superintendents of training-schools is that this period commences about seven years of age. It is seldom advisable to remove an idiot child from his home, if he has any mother at all, before this time, unless there be some nervous disease likely to be benefited by medical care. There seems no reason to doubt that early admission to a training-school is of much greater advantage than a later one, improving the mental powers, eradicating bad habits, hindering their formation, and preventing diseases and diseased tendencies ere they become inveterate. Idiots and imbeciles often continue susceptible of improvement at a late age. In my own experience pupils who came in at older, say from twelve to eighteen, have been found to improve more than those admitted at an earlier period of life. The reason of this seems to be that, in Scotland at least, parents are much readier to apply for admission for children whose idiocy is strongly marked, or who are mischievous or troublesome, than for those who are docile, and present hopes of their intelligence opening. Parents often persist in denying that their children are imbecile, though everybody round about has made up his mind on the subject for years. The length this deception can be carried, almost incredible to an indifferent person, might be treated with indulgent pity were it not sometimes the cause of serious loss to the child.

Dr Kind of Langenhagen, whose observations on the growth of idiots has led him ripely to consider the best age for a pupil being sent to a training-school, thinks that those who suffer from constitutional diseases capable of improvement under treatment cannot be sent in too soon; but if the circumstances of the parents or the conditions of the charitable institution do not allow of the pupil remaining longer than four or five years under training, that the best time to send him to the training-school is between the twelfth and sixteenth year.

Is the association of Idiots with one another hurtful?

I am frequently asked by parents whether intercourse with other imbecile children has not an unhappy effect upon the growth of the intelligence of a new-comer. This, however, is not the case. Imbecile children are no more injured by the presence of others of inferior intelligence than ordinary boys and girls are made childish by the appearance of a baby in the house. On the other hand, imbecile children are often ill-used and made to do ridiculous and improper things when they are sent to schools where the more intelligent pupils are unfeeling enough to take advantage of their simplicity. It is often indeed a great advantage for children to get rid of the uniform and hopeless inferiority in which they have hitherto lived, and to find that they have equals with whom they can interchange their simple ideas, and who give them a ready sympathy, and even to find that they have inferiors.

Dr Langdon Down says: 'I have seen the relative of a noble, living in all the luxury of a country house, so put aside by her sisters, senior as well as junior, that she never ventured on a remark, and at length lost speech. I have seen the same girl at Normansfield pass from monosyllables to thorough conversational language, amid the companionship and sympathy of her compeers.'

There is, however, a danger of moral contamination in large institutions where imbeciles from the worst quarters of our large towns come in contact with children hitherto carefully tended and kept away from impure influences and bad examples.

How low can we begin to Teach?

One of the earliest attempts at teaching may be said to be teaching habits of cleanliness to the child. It is often very difficult to form these habits, and they are easily lost, for

example, by a change of residence, or even the change of a bedroom, confusing the feeble intelligence of the poor child. Seguin gives directions how to cultivate the rudimentary perception of distance and the knowledge of direction. I have much doubt, while acknowledging Dr Seguin's great skill in teaching, that in training the lowest grades of idiocy he has sometimes confounded what was really the spontaneous work of the mind with the results of tuition, and that the view which he traces, in so graphic a manner, of one almost inert faculty after another having been called into healthy play by the mere art of the teacher, is to a certain extent deceptive. Nevertheless, Seguin's books on Idiocy will always be valuable from the correct principles which he applied to education, warmed by his hopeful enthusiasm and the overflowing kindliness of his nature.

Teaching to Speak.

As a general rule idiots speak according to the measure of their ideas, and the most intelligent speak best and use most words. The greater number of those who remain mute do not speak simply because they have no ideas to express. The only way to teach them to speak is to cultivate their perceptive faculties, and to try to increase the growth and nutrition of the brain and other organs. As their mental faculties improve words come. In these cases the mental powers and the speech are symmetrical; but there are other cases where the mental manifestations and the speech are not deficient in ordinary proportion to one another. This is also true with normal children; in some, speech comes very slowly after their ideas; in others, it more nearly keeps pace with them. Occasionally we meet with imbecile children who run about, notice things, understand much of what is said to them, but who remain mute; while other

imbeciles, with fewer ideas, learn to speak, and even to be voluble in talk.

Aphasic Idiots.

Among the mutes we had, for example, a girl aged eleven, whose deficiency was traced to convulsions in infancy and epilepsy, who could sew, make beds, take off and put on her own clothes, but who could only repeat her own name like a cuckoo.

There was also a lad of sixteen—cause of imbecility, convulsions at teething—who copied letters, had ideas of propriety, order, and arrangement, could take care of himself, and was kind to small children. He knew many of the qualities of objects, and had ideas of number and colour. He could string beads, selecting the correct number and the proper colours to form the required pattern. He could pronounce all the different elements of sound, but many words were too difficult for him; nevertheless, he was taught to repeat a good number of words, though often with great difficulty. He understood many more without being able to pronounce them. The number of words which he himself could recall bore a very small proportion to those he knew or could utter when prompted. He appeared to have a great difficulty in articulating; but this, in some measure, might have been owing to disuse of the vocal organs. If told to repeat so many words, he would often utter some indistinct sounds, generally giving the same number of syllables or sounds and the tone of the words he was asked to repeat; and although he understood the meaning of these words, he seemed quite satisfied with his own imperfect reproduction of them, and looked surprised that it was not found satisfactory.*

* Dr C. Spamer has noted that some patients with aphasia did not recognise the incorrectness of what they had spoken or written, though they quite well understood what was said or written to them. It is difficult, he remarks, to com-

He readily dropped using the words which he had been taught, returning to his old mimic signs. This was to a less extent true of two other pupils in the house. M. L. recognised words spoken to her, and would pronounce a word shown to her on hearing the first syllable; she knew the power of the letters of the alphabet, but could not name them.

Idiots seldom learn to speak much if they do not begin before six or seven. I have one pupil, B. N., who began as late as nine years of age. He has improved a great deal during a training which has now lasted four years, but he still speaks imperfectly, like a child of two years old. He still has a slight paralysis on the left side of the face. Some of these cases occasionally utter a few words sufficient to prove that their vocal apparatus is not structurally deficient, and that, for the moment at least, it may be brought into play. As far as I can see, the deficiency is more often in the nervous centres than in the nerves or muscles. Where there is a want of synergy in the muscles concerned with the voice, one would rather expect stuttering or tremulous and imperfect utterance than mutism. They rarely want synergy in any of the other muscles, even in those supplied by the same nerves, and when they do utter a word or two at an odd time they generally pronounce them correctly. Speech is a complex faculty, dependent upon the integrity of several functions, and liable to be deranged by a variety of diseases of the nervous system, as we observe in the trembling pronunciation so characteristic of general paralysis, in the lachrymose tones following paralysis from cerebral hæmorrhage or softening, and in the stuttering associated with chorea. In labio-glosso-pharyngeal paralysis the diminution or loss of the

prehend how one can correctly recognise the right symbol and not recognise his own false rendering of the same symbol—'Ueber Aphasia und Asymbolia, *Archiv für Psychiatrie*, Band vi, Heft 2.

powers of articulation is accompanied by great impairment or loss of the power of swallowing. It is dependent on a local lesion, or disease of the corpora olivaria, and atrophy of the roots of the hypoglossal and upper spinal nerves.

Amongst the deviations of ordinary aphasia or the perturbations of language met with in lunatic asylums, we have many analogies to what is observed in idiocy. Lunatics occasionally repeat gibberish, or use words out of their meaning, and seem surprised they are not understood, or repeat the last words said to them like an echo. They sometimes drop the verbs and articles, as idiots as well as the deaf and dumb are so prone to do. Sometimes they keep on repeating a word which they have learned after being asked to pronounce a new one. Occasionally, on being asked to repeat several words, they content themselves by repeating the last word or last syllable only, though when pressed they are able to say the whole sentence.

Relation of Speech to Thought.

Sometimes imbecile mutes commence to speak suddenly, without anybody being able to tell why. Sometimes they use words under deep emotion which they never did before. Unhappily, the use of the voice in ordinary cases of idiotic mutism passes away with the emotion that called it for the moment into play.

Language itself is a well-nigh indispensable element in education ; sometimes it may impede thought, but it generally supports it. Words represent and recall definitions and generalisations, and little progress can be made in education unless the pupil has a language of one kind or another. In the deaf and dumb the perceptive faculties are generally well developed, but before being educated their mental powers are in a rudimentary state. After being educated at school they can describe events which struck them years before, but their

thoughts never seem to have gone far beyond the visible world, and they are quite unacquainted with anything outside the sphere of their own observations. Deaf-mutes never arrive at any ideas of God or immortality from their own observations and cogitations. Even after being taken to church for years they fail to comprehend that people assemble together to worship a superior being. One deaf-mute being interrogated about his notions previous to being educated, said—'I knew but little about death. I dreaded to think that it would seize my body. The body would turn into a cold corpse, and lie beneath a dreary grave for ever.' Another said—'I did not know anything of death before I saw it, but when death happened I observed it with feelings of fear. Frequently the thought of such death was very unpleasant to me. I refused to yield to death, and thought I would live for ever.' *

The first object in the education of the deaf and dumb is to give them a language, the language of signs, or the finger or written language, or to teach them to speak by the German method. With idiots, too, it should be a prime object to give them a language, and they have at least this advantage over the deaf, that they can hear words, and they often understand speech, though they are mute. If all attempts fail to get them to repeat words, encourage them to make signs, and be not too ready to repress their signs in the hope that they will take to speaking instead. The signs, at any rate, exercise the faculty of language or expression, the power of associating symbols with conceptions and the desire of exhibiting these symbols to others. If their mutism seems hopeless, teach them figurative signs, such as are done in deaf and dumb schools. These are what is truly called the natural language of the deaf and dumb. They are,

* These extracts are taken from the Forty-sixth Annual Report of the American Asylum at Hartford.

in fact, symbols addressed to the eye, just as words are symbols addressed to the ear, and they are sometimes more suggestive and less arbitrary than words. The figurative sign for a man is made by touching the chin, as man is distinguished by having a beard. The sign for a woman is drawing the finger along the crown where the hair is divided; the sun is indicated by looking up and shutting the eyes; to sleep, by laying the head down on the hand; to think, by pointing to the forehead; to dream, by combining the two signs, so as to express thinking and sleep.

The Abbé Sicard attempted to give this system of expression a development equal to that of a spoken language, with signs to denote grammatical distinctions and inflexions; and the sign language used in the different schools has been much improved by seventy years familiar use. It is assuredly a great pity that the different deaf and dumb schools do not adopt a common system of figurative signs, which would be equivalent to a common language. Though imbeciles may be taught a number of figurative signs which may be useful to them, their proficiency will necessarily fall far below that of the deaf and dumb.

Methods of Teaching Speech.

The method which I have used in teaching imbecile children to speak is, as far as can be generalised, somewhat as follows:— Granting the existence of ideas sufficiently numerous to make speaking a possible attainment, the desire to imitate sounds more or less, and the consequent use of the different muscles of the vocal apparatus, I am inclined to think that the trial may be made without any such preliminary drill, such as is directed by some authorities on the education of idiots, who hold that at the outset the pupil is to be made to move his lips, jaws, and tongue, without uttering a sound, as the barber's brother in the Arabian Nights was directed by the Barmecide

to use his hands, lips, and jaws, in the carving and mastication of an imaginary banquet; and as the docility of the barber's brother in making the required motions led to his being in the end allowed to enjoy a feast in good earnest, we are told 'that the success of these lessons entirely depends upon the grounding in the preliminary drill, and it is simply waste of time to attempt them if the muscles of the jaws, tongue, and lips are not well nourished, or well under the command of the will.'

But almost all those preliminary motions can be called into play, and are every day executed during the process of eating, as almost all the muscles used in deglutition are also used in speaking; and if the lips require separate exercise, this will be much easier done by providing the child with a whistle, and encouraging him to blow upon it, than by making him press his lips on a flat piece of boxwood. At the same time we do not deny the indirect advantage of ordinary drill in helping the utterance of speech by increasing the general command over the muscles.

Analysis of Vocal Sounds.

The first words which the pupil can be most easily taught to say are nasal sounds, like *me* and *no*, explosive consonants like *p* and *b*, though there are so many exceptions that there is some difficulty in making a general statement. The vowels—that is the real vowels separated from the diphthongs—are generally easily taught. Sweetmeats and other coveted objects may be held up before the children as a means of inducing them to imitate easy sounds, and the requisite motions of the lips and tongue ought, as far as possible, .to be exhibited. It must, however, be borne in mind that these motions are often extremely delicate adjustments of the different muscles of the tongue and fauces, and that some of them might be performed in different ways, and yet ensure the utterance of the same sound.

As the pupil acquires the capacity of imitating a few words, the teacher will be able to note if he be deficient in pronouncing particular sounds, and from this to find out the vocal organ which may be defective in function or structure. In doing so he ought to pay attention to the following considerations :—

The musical voice is produced in the larynx principally by the varying state of tension of the vocal cords ; but the speaking voice—*i.e.*, the articulation of words—can be perfectly produced without the use of the larnyx ; in this case speech is conducted in a whisper, hence we know that when a patient whispers the larynx is not in use. This may be owing to mental emotion, an indolent or feeble habit, deficient power in the laryngeal nerves or muscles, or by some affection of the lining mucous membrane of the laryngeal cavity, such as inflammation, swelling, ulcers, warts, polypi, or other tumours.

The vowels are uttered by narrowing the opening, and otherwise adapting the form of the oral orifices, fixing them in one shape and position, and then simply expelling the air from the lungs. The utterance of vowels can thus be prolonged as long as the breath lasts. This is not the case with the diphthongs, of which the English *i*, as in *silent*, is one. They are produced by pronouncing one vowel, and then rapidly changing the position of the mouth to that necessary for the production of a second vowel, as in *æ=ae; ai, a, i*, English *i, au, a, u; œ, o, e; oi, o, i; ou, o, u.* Y at the beginning of a word may be regarded as a diphthong.

The consonants are produced by interruptions in the expelled stream of air, brought about by various motions of the throat, palate, tongue, lips, and jaws.

They are divided into two classes—

I.—*Explosive consonants, whose sound escapes with the breath and cannot be prolonged—*

b, *p*, formed by approaching the lips; *d*, *t*, formed by approaching the tongue to the arch of the palate.

In *b*, *d*, and *g*, the mouth is closed and opened more slowly than in *p*, *t*, and *k*, where the action of the lips, tongue, and throat is more abrupt.

II.—*Continuous consonants, in pronouncing which the breath escapes by degrees, and the sounds can be prolonged—*

v, *f*, are pronounced by approaching the lower lips to the upper teeth.

s, *z*, are pronounced by passing the breath through the teeth, at the same time raising the tip of the tongue. Hence, when the front teeth are wanting, they are pronounced with difficulty.

m, *n*, are pronounced by passing the breath through the nose, and making at the same time certain vibrations of the throat and soft palate.

s (soft), *b*, *r*, are pronounced by flattening the tip of the tongue and passing the breath between it and the front of the hard palate. In pronouncing *r* the tongue is more flattened than in pronouncing *l*. In this case the deficiency is in the tongue. Speakers who cannot pronounce *r* generally replace it by *l*, sometimes by *w* or *y*. *h* is only a breathing sound, produced by increase of expulsive power of the expired air.

Cleft palate gives a nasal timbre to the voice; a highly vaulted palate gives a confused manner of speaking, and a tendency to clip or shorten words. When the lips are short, the muscles which move them weak, or the teeth protruding, there is often a difficulty in pronouncing the explosive consonants. This has been already referred to in the chapter on Paralytic Idiocy.

One imbecile female, aged twenty-three, cannot sound *p*, *t*, and *k*, using in their place, *b*, *d*, and *g*. A boy, aged twelve, K. U., partially hemiplegic, is utterly unable to pronounce

k at the beginning of a word; he also fails in saying *ch* and *th;* while a third pupil, a boy, aged nine, always substitutes *t* for *k*, and does not pronounce the sound of *l* after a consonant. Thus, if you ask him to say clack he will say tat; if you ask him to say pluck he will say put; if you ask him to say cuckoo he will say tutoo. This is owing to his raising the tip of his tongue instead of using the soft palate and back of the tongue. If the tongue is kept down even by a thin slip of paper, he pronounces *k* very plainly, and may be even taught to do it by enforced attention to the motion of his tongue.

B. N., the boy referred to at page 360, could not pronounce *b*, *p*, *l*, *f*, *g*, and *r*, and rarely uses an aspirate. He would say doat for goat, kenny for penny, toten for spoken, tack for sack, and so on.

Stammering is very common with idiots who speak. Dr Wyllie* treats the view of Arnott and Müller that this affection is due to spasmodic closure of the glottis as erroneous. With him it is owing to deranged innervation, entailing loss of command of the laryngeal mechanism which is principally felt in the first syllable of words. The accompaniments of the tongue and lips are not properly timed, and the energy flows in wrong directions. It seems to me that with weak-minded persons the stops may be in the larynx or in the lips. Dr Wyllie's analysis of sound and his advice to the stammerer, though useful to persons of intelligence, are of no practical moment in the treatment of stammering with imbeciles. As stammering does not occur in singing, the pupil should be exercised therein and also repeating poetry in musical tones. Improvement is effected through the gaining of confidence, and command of the muscles by better health and gymnastic exercises. With such children the prognosis is good. Berkhan states that

* See *The Disorders of Speech*, by John Wyllie, M.D., Edinburgh, 1894.

amongst 352 children in the school for weak-minded children at Brunswick, there were 145 stammerers, of whom 92 were cured, and the rest improved.

How to overcome deficiencies.

When, by patient and reflective use of such preliminary facts, the several deficiencies are traced to their real source, attempts may be made to remove them. Loss of the musical voice, as evidenced by hoarseness and whispering, ought to be treated medically or otherwise, as the nature of the case seems to demand. Sometimes the patient uses the musical voice under the influence of emotion or desire; while on other occasions he speaks in a whisper; in this case he may, if fond of music, be induced to sing.

The interior of the larynx of the patient might be examined by the laryngoscope in hopes of finding lesions which could be treated surgically, or Morell Mackenzie's galvaniser might be used if local deficiency of nervous power were suspected.

In teaching imbecile mutes to speak, it is of course advisable to open the mouth widely, and show the pupils the different muscular motions of the lips, tongue, and throat, as far as these can be made visible.

When the deficiency is found to consist in malformation or weakness of the lips, it may be corrected by exercising these organs in articulation. The proper motions of the lips being more visible are more readily taught than those of any other part of the vocal apparatus, and, through patient teaching, all the sounds may be correctly produced. Certain consonants, such as *k* and *s*, which the patient cannot produce at the beginning of a word, can be occasionally pronounced in the middle; thus the patient can be taught to say istop when he cannot say stop, and icap when he cannot say cap; sometimes he can say on when he cannot say no. In this

way the pupil can be taught to approach and finally to pronounce the desired word.

They should from the beginning be taught to speak loud. To the dull and lazy energetic utterance has a rousing effect. It is to be noticed that imbeciles, who are extremely anxious to save themselves trouble, readily fall into the habit of passing over difficult sounds or of retaining certain infantile conventional words, although they are perfectly able to utter any combination of syllables. Difficulties like these must be overcome by moral persuasion, and presevering exercise of the sounds habitually slurred over, and by refusing to give them objects which they desire unless their names are properly pronounced. Deficiencies of pronunciation are frequently aggravated by lisping, as they become older and lose their front teeth, which, as already explained, is not uncommon with the idiotic and imbecile.

What Pupils benefit most.

In general it will be found of no use to try to teach idiots to speak who have never voluntarily uttered a sound; but when they begin to say a few words the process can be much accelerated by the persevering efforts of the teacher. Great benefit is also derived from giving vocal exercises to those children who are deficient in pronunciation. When speech has fairly begun, a change of scene for a few weeks has sometimes a good effect in hastening progress, as it gives the mind new perceptions, new feelings, and something new to communicate. When the child has fairly begun to emit sounds, the best plan is to teach monosyllabic names of familiar objects, which ought always to be shown to him at the same time. When he is able to combine words, he may be asked simple questions or taught nursery rhymes. The progress the child makes will of course depend very much on the

extent of his mental faculties and the subsequent cultivation given to them.

Sollier* proposes to take the degree of attention as a measure of comparison in idiots and imbeciles. It may be granted that as a general rule there is a correspondence between the amount of voluntary attention which can be directed and the amount of intelligence, and certainly the amount of attention is of prime importance to the teacher. Darwin has observed that trainers of animals always prefer one for their purposes who shows most attention, that is, attention to perform exercises not natural to the animal. Teachers in ordinary schools prefer the most attentive and docile children to the others, who, however, do not always show the most mental power in after-life. It would be easy to make similar objections to a standard based upon attention which Sollier makes to those based upon speech or comparison with normal children of different ages, for there are many exceptions. Attention is not always correlative with intellect; in neurasthenia the attention is weak, while the intellect may be powerful and rapid, though speedily exhausted. As we have already observed, it is a mistake to characterise idiocy by the weakness of any one faculty.

Cultivation of the Senses—Touch.

The sense of touch often requires careful cultivation. This is totally neglected in ordinary education, but in teaching the blind it is of the highest importance, and the instructor of idiots may derive much benefit from visiting a school for the blind. Touch and feeling are naturally cultivated along with the use of the muscles. The pupil ought to be taught to grasp firmly; if he cannot do so spon-

* See the able work, *Psychologie de l'Idiot et de l'Imbecile*, par le Dr Paul Sollier. Paris, 1891.

taneously, another hand should envelope his and close it forcibly upon an object. If he can grasp, but is feeble or unwilling to hold on, put him on the steps of a ladder and let him hold on to save himself. At a later date he may be taught to push a wheelbarrow, or to fill it with stones. Rude adjustments of the muscles are taught first, then finer ones. In the school we make them practise putting rivet-nails into holes in a board, winding strings, threading beads, tying knots, and putting in buttons. These apparently simple actions require to be taught in a careful and systematic manner. It often takes much trouble to teach an imbecile child to put off and on his own clothes. The child must be taught to avoid the fire by showing him how a hot cinder can give pain. This lesson is important, as some idiots are fond of lighting matches or playing with flames, and few of them would have the sense to extinguish fire if it caught their clothes.

The pupil ought to be made to observe what is round, what is smooth, what is angular, and so on; that the round will roll, that the smooth will glide, that the rough will rasp, and that the sharp will cut or prick. When snow falls, for example, take a flake and show the child that it is white and cold, close his hand upon it and show him that it has become hard. Make it into a snowball, and show him that it is round, cold, smooth, white, and damp. Make him hold a little snow in his hand till it melts, and put the snowball before the fire; make him note that it is turned into water, and try to explain that this water goes off in steam; that the snow and rain come from the clouds. The endless variety of nature gives abundance of object lessons like this, suited for the simple-minded. It is needless to go into detail by describing a series of processes, for instruction is not like the preparation of some chemical compound, to be obtained by placing certain substances together of a given weight and at

given temperatures, and then leaving them to react on one another. Those who have a talent for teaching will seize the method quickly and apply it to different cases, while with dull and indolent teachers it is apt to degenerate into a weary and listless repetition of 'finger exercises,' outside the mind of the pupil, as well as that of the so-called instructor, a mere automatic form in a new direction.

Cultivation of the Sense of Sight.

Everything should be taught upon an object,—that is, the object should be shown to the child, and he should be attracted or led to look at or examine it, when its properties should be explained, and the teacher should not pass on to any other thing else till he is sure the lesson has passed into the child's mind. The sense of sight is to be educated by making the pupil note the difference between light and darkness, and at a later stage by making him note the difference of colours,—showing, for example, a ray of sunshine striking into a darkened room, showing bright colours in a bright light, and then teaching him to match them. This may be done by using coloured balls and making the pupil put them into sockets of the same hue, like those in the bagatelle board, or he may be made to match coloured papers or to string coloured beads. The recognition of the colour often precedes by a good while the name of it. We have known instances where the pupil learned to pick out black and white, and failed to distinguish other colours save by picking the black and white from them. The observation of the shape of forms can be taught in a similar way. Blocks of wood cut into the form of squares, circles, globes, triangles, etc., are given to the pupil, and he is directed to put them into the corresponding sockets.

Cultivation of the Sense of Hearing and Music.

The hearing of idiots is often defective, as has already been explained; but some parents are apt to believe that a child is deaf because it does not speak, and as many such idiots are very inert to sounds, it may require some careful experiments in order to ascertain whether they can really hear. The idiot is seldom inattentive to all sounds, if the mechanism of the ear be perfect. Guggenbühl used a gong to arouse the languid attention to vibrations. Many idiots who do not understand words, or pay no attention to the human voice, are fond of music, whether vocal or instrumental. They prefer lively tunes, which can be easily followed, and can be got to hum tunes even although they cannot speak. Thus the cultivation of an ear for music may be commenced at a very early period of education. The only method practicable in teaching music to idiots is to repeat the tunes over and over till they are caught and remembered. There is generally greater difficulty in teaching the words than the music of a song.

Smell and Taste.

The sense of smell may be educated by holding to the nose different bottles of substances with stimulating odours, until they are able to recognise them without seeing them. Where the idiot eats garbage or roots, the sense of taste is generally improved by careful watching and regular food.

Kindergarten.

All the exercises should be progressive; the completion of one lesson should be the starting point of another and a higher one. The teacher should always keep in mind that

they are not ends of themselves, but means to an end,—that is, the improvement of the intellectual capacity. Many of the exercises in Froebel's system of infant training, generally called the Kindergarten,* are very applicable to feeble-minded and backward children; indeed, in my opinion, they are only applicable to such children.

Gymnastic Drill.

The importance of drill and open-air exercise cannot be exaggerated, both in correcting automatic and spasmodic motions, in strengthening the frame, and giving the pupil a more perfect command over his muscles. Sometimes the teacher is compelled to begin by holding the passive arms of the idiot and imparting a variety of motions, which in process of time the pupil accompanies with motions of his own, until he at length catches the spirit of imitation. Bad walkers may be taught to correct their gait by treading upon footsteps marked on the floor or upon the rounds of a ladder laid on the ground. The balance may be improved by making them walk across a plank. I have found a ladder placed against a high wall one of the most serviceable apparatus. By placing the child on it and encouraging him to mount, we compel attention, exercise the grasp, the footing, and the sense of equilibrium. They should be exercised in catching what is thrown to them. Shooting with the bow and arrow is a very good exercise for the eye and hand, and I have seen some imbeciles become expert at it, only it requires considerable precaution in case of accident. What is called musical drill—that is going through a formal series of exercises in keeping time with some musical instrument—is very popular with

* There is a good exposition of Froebel's system in a *Practical Guide to the English Kindergarten*, etc., by Johann and Bertha Ronge. London: Myres & Co. Also *The Kindergarten Principle*, by Mary Lyschinska, London.

There is a good list of school-books and appliances at the end of Dr Shuttleworth's book on *Mentally Deficient Children*.

idiots. At Clapton Asylum I saw this species of drill conducted with great spirit by an old life-guard's man, who used a common tin whistle with wonderful effect. Dancing may be regarded as an advanced form of drill, and as such is useful. The best forms of drill for imbeciles are adaptations of Ling's methods, which are designed to throw all the muscles of the body into exercise, are used in all the primary schools in Sweden and Norway.*

Arithmetic.

Teaching numbers requires more than usual patience, as on this point idiots are peculiarly deficient. The knowledge of numbers, however, is necessary for so many transactions of life, that it cannot possibly be omitted. They must therefore be carefully exercised in counting objects, reckoning money, the number of days in the week and hours in the day; and even after obtaining an apparently considerable proficiency in arithmetic, they are very apt to fail in a new application, or to be confused by some trifling change in the method of stating a question. Numbers with them must always be taught upon the object—upon the bead-frame, for example, or to count a certain number of beads or pebbles; anything will do if it be movable and all of the same kind. See that the child can set apart so many beans, or string so many beads on a wire, and then teach him to repeat the corresponding number. When he can count thirty the pupil may commence simple addition—that is, by adding twos and threes together upon the ball frame. About the same time they begin to learn the written symbols of figures, but it will be long before these can be substituted for the

* As a suitable manual for drill, I can recommend the *Gymnastic Exercises*, by Dr Mathias, Roth, Joseph Myres & Co., London; and also *The A B C of the Swedish System of Educational Gymnastics*, by Hartvig Nissen; Davis, Philadelphia and London, 1891.

actual numbers counted out. One may begin adding figures, with the corresponding numbers in dots, as recommended by Pestalozzi, thus :—

2 . .
3 .·.
4 : :
— ——
9 ⁝ ⁝ ⁝

The abstract idea of quantity, represented by expressions, such as many, big, plenty, is generally taken up spontaneously. Most children who are educable at all can distinguish between a big bit of bread and a small one, or a cup of milk full or half full.

The great difficulty in teaching numbers to imbeciles begins with those above five. Addition, subtraction, and multiplication may be got over, but few of them make much of division. Teaching them to play at dominoes is useful in cultivating the counting faculty.

The shop lesson consists in having a number of different articles, weighing and measuring them, and selling them to the children for pieces of money, they being directed to count the articles, give the proper money in different coins, count the change—in short, going through all the ordinary operations of buying and selling. This exercise is with imbeciles in the highest degree useful and interesting.

Reading.

Learning the alphabet may be viewed in two lights : as a means of fixing the attention, and teaching the child to attach a name to a particular form, or the beginning of the process of learning to read. Parents are apt to attach great importance to progress in reading, saying that the child would improve if he would only learn to read ; and if there be no improvement in reading, they sometimes assume that no progress has been made ; but before reading can become a

means of knowledge, the mind must have attained a considerable capacity. Many idiots can be educated in a variety of ways who cannot learn to read, or learn to do so imperfectly. Guggenbühl and Seguin resorted to the device of tracing letters in phosphoric acid on the wall of a dark room, in order to rouse the languid attention of the child; but it seems to me that a child who could only learn letters in this way would scarcely be able to combine them; in short, that with such a feeble intellect he could never be expected to learn to read a hundred words. Some idiots can only be taught to combine words of one syllable, others of two. In any case their progress is slow, and requires extreme patience. It may take five or six years for an imbecile child to learn to read an easy story-book.

When one compares the simple and serviceable alphabet which the Phœnicians transmitted to the Greeks, and their direct way of using the letters, one sees how much we have fallen back. What dreadful entanglements have we got into with our absurd spelling of the English language! The same combinations of letters instead of always having the same meaning, often express different sounds, and the same sounds are often expressed by different combinations of letters. This presents a great difficulty in teaching ordinary children to read which is scarcely felt in Germany, for the Germans are watchful to keep up their phonetic spelling. 'The wonder is,' as Mr Meiklejohn has remarked, 'that the child does learn it at last, and many children leave school with so weak a grip of this notation that they soon forget it, or at best never learn to read with ease and pleasure to themselves and their friends.' After exposing the anomalies of our spelling, Mr Meiklejohn observes:—

The real fact is, that the exceptions make themselves quite as important as the rule; that the child is not guided by rule at all; and that he learns each word separately and

as an individual. One may readily conceive how bewildering these aberrations of the alphabet are to the poor imbecile in his reading-lessons.

A simple-minded girl who had learned to read once said to me, as if a bright idea had just struck her, 'You sometimes can know how to say a word from the way it is spelt.'

The best way to teach them to read is to teach them to recognise syllables before teaching them to know their letters; for this purpose short words would be selected, with which the power of the letters is equal. Some imbeciles learn to read words with little knowledge of the sense, and some who cannot read learn to spell words by hearing others do so. Not unfrequently they learn to spell quicker than to read. Imbeciles are not helped by the context like ordinary children. The generality of reading books where the lessons are easy at the beginning, and difficult at the end, are not well adapted for imbeciles, whose intelligence does not increase fast enough to keep up with this 'step by step' process. The more intelligent class of imbeciles in the end learn to read books, and even to become fond of reading.

Writing.

Writing may be viewed in the same way as an exercise for the sense of attention, and for the fingers, as well as the commencement of a useful art. The commencement is often very difficult, and it is easier to make them begin by writing on a slate, after which they may be taught to write over a traced copy. Sometimes the hand of the pupil requires to be guided by the teacher for weeks, or even months, before he can form a letter. Sometimes idiots learn to trace letters without being able to read them, and some boys of considerable intelligence are very bad writers. The handwriting is generally shaky and unequal; difficult letters are missed out. In writing they have often a tendency to slant the letters

strongly towards the left, which is difficult to overcome. Imbeciles seldom learn to write well.

Moral and Religious Tuition.

If I do not write a long vague chapter on the moral training of idiocy it is not because I fail to recognise the vast importance of the subject. Without moral training mere education of the intellect would only render imbeciles more mischievous and cunning. But it is very difficult to frame general precepts which would be of any use in treating difficult cases. The moral culture of imbeciles differs from what we give to children, mainly in this, that they are likely to continue to be children, in most cases all their lives. Thus normal children may be encouraged to learn to work by giving them what they earn, and trusting them, in a great measure, to spend the money as they like : but although a few pence may be given now and then to encourage imbeciles to work, it would be a mistake to allow the notion to grow in their minds that they themselves should be allowed to spend what they earn. As already said, imbeciles can be taught the simpler moral relations just like children, and they can also be taught the main truths of religion, but this must be inculcated by teaching, not by preaching.

When puberty comes on it creates with those idiots whom it affects a difference between them and ordinary children. Great care and great good sense is required to tide them successfully over the first years, which are the most difficult. Imbecile girls are not safe as a general rule, either in the indigent and crowded quarters of large towns, or in large villages, unless they be incessantly watched, which indeed is very difficult.

The Teaching of Trades.

It is often a difficult question, what amount of special,

and what amount of general training should be given? In an institution supported by private charity, the temptation is strong to single out a special faculty which is more prominent than the rest, and to try to educate it, forgetting all the others. The result may be striking: an idiot who can paint portraits, an idiot who can make models of ships which look pretty well out of the water, an idiot who can spell backwards with great rapidity; but the question comes—whether this is best for the pupils? Would he ever make his bread as a portrait painter or a maker of models? If there is a fair chance of this, as sometimes happens, then of course his instruction is a great benefit to him; but if it should turn out to be an accomplishment never to be completed, and leading to nothing beyond, the time and labour bestowed upon him is not adequately repaid. On the other hand, a certain amount of cultivation, however small, given to the moral nature, to the perceptive and reflective powers, and to the general habits of an imbecile, is always an advantage both to himself and to his parents and guardians, and, entering into daily use, is not readily lost. Nevertheless it is of great importance to teach imbeciles to work. They are naturally indolent, and work must be made a habit before it becomes agreeable. Once they have fairly learnt it, it may fill up many dreary hours in their life, and may lead to their making their bread, or being very helpful to others. The trades generally taught in training-schools are mat-making, brush-making, shoe-making, mattress-making, cane-bottom and basket-making, carpentry, tailoring, and the cultivation of the ground. Sash cord-making seems to promise well; and cigar-making is carried on at the celebrated school at the Hague for Minderjarige Idioten. As the pupils are of different strengths, capacities, and powers of standing exposure, a variety of employments is needed.

Self-supporting Imbeciles.

There are some instances recorded in the reports of training-schools of imbeciles who have learned to support themselves. This in general is after a long apprenticeship of ten or twelve years. In any case it is no easy matter to bring about such results, as trades are taught in the ordinary institutions for idiots, where they are very often withdrawn even before they are strong enough to commence any handicraft, either to be totally neglected, or to get under less advantageous circumstances the additional instruction which they require.

It is becoming every year more and more difficult for a man to follow any trade, such as we can carry on without the use of machinery and great division of labour. In a country like India, where the arts are still simple, or in Australia or America, where labour is so much in demand, our problem would be much easier to work out ; but in these islands the great bulk of inferior labourers support themselves by working in factories ; and those who take to skilled labour have as much difficulty in displacing competition as in doing work when they get it. The question whether many imbeciles are not fit for easy factory labour ought to be kept in view. I only know one instance of an imbecile supporting himself by working in a factory.

In America, where there is a great demand for bodily labour, and land is cheap and easy to be had, a much larger proportion of imbeciles are said to be earning their bread. 'Of five hundred individuals,' writes Dr Kerlin,* 'received and trained at this Institution, eighty-one are capable of earning their own support in domestic service, farming, or certain shop employments, under influences of favourable protection, such as have been named.' Dr Doren of the Ohio

* Eighteenth Report of the Pennsylvania Training-School, p. 9.

Asylum claims that 25 per cent. of his cases have become productive workers, still requiring, it will be understood, a greater or less degree of kindly supervision. The kind of 'favourable protection' needed is thus defined by Dr Kerlin :—

'It is certain that of those who are sent out from institutions of this kind as "self-supporting," there are but few individuals who will not *always* need judicious and considerate guardianship. They lack that judgment or forecast which anticipates and provides for the needs of the future—they possess little or no insight of character—they are either irritable and suspicious or weakly credulous, lacking that combativeness which is self-protection, and gives equality among fellows; hence without the guardianship of merciful relatives or friends, who are considerate of their defects, they fail of success, are bitterly imposed upon, or may become the easy dupes and facile tools of rascals and knaves.'

In America the ordinary class of pupils at schools for the imbecile or feeble-minded are more educable, as the superintendents have the power of sending home cases proved to be insusceptible of improvement, and as they are sustained by the State, pupils are kept till their education is completed. As Pestalozzi has expressed it: Nur das vollendete ist brauchbar; nur das vollendete führt weiter. 'Only what is finished is useful; only what is finished leads to anything beyond.'

Results of Teaching.

We do not profess to be able to transmute feeble-minded into normal children, but we know well that idiots and imbeciles, even when otherwise well tended, yet suffer from the want of education both in their habits and in their intelligence, and that within their own range they are as educable and often more educable than normal children. This is especially

the case where nervous diseases have been successfully treated, or where through diet and regimen the tone of the constitution has been much improved. Some seem to hold that if such creatures are fed and kept clean, and dressed up like dolls and kept confined lest they should dirty their clothes, as much is done as is worth the trouble. But an asylum for idiots where there were no teaching and no progress would be like a marsh which takes in and accumulates everything noisome and gives out nothing.

A system of teaching which has been carried on for half a century should begin to stand upon its own merits, so we shall leave out some of the testimonials in its favour which were cited twenty years ago.

Besetting those in charge of such training-schools there are some temptations. One is to make too much of the *mise-en-scène*, to put the pupils behind the furnishings, retrench the needful for the superfluous, and spend money on decorations to strike the eye of the visitor, while many poor children are left out in the cold for want of funds. Another is to turn away from pupils of a low grade, and to expend the teaching energies upon more favoured children who show better proofs of learning. As a distinguished member of our profession said to me, speaking of a well-known asylum: 'I find that they will not look at an idiot.' Such is the wisdom of a shallow generation. I go not so far as Leopardi, to say that men dislike realities, but it is repugnant to their indolence to search for realities behind appearances. Teachers of the imbecile have no codes to push their pupils through and no inspectors. As for the parents, many of them will never be pleased unless their children are educated to the level of ordinary ones; yet some are patient and reasonable, and grateful for small improvements. I have found the difficulty of directing the education of imbecile children nothing to the task of educating directors. The children at any rate never

pretended to understand what they had never studied, nor tried to throw the blame of their own blunders upon those who had given them timely warning.

The necessity of a distinctive treatment for idiots has been repeatedly urged by the English Lunacy Commissioners, as in the following passage from their Report for 1865 :—

'It has long been our opinion, as the result of extended experience and observation, that the association of idiot children with lunatics is very objectionable and injurious to them, and upon our visits to county asylums we have frequently suggested arrangements for their separate treatment and instruction. It is always to us a painful thing to see idiot children, whose mental faculties and physical powers and habits are capable of much development and improvement, wandering, without object or special care, about the wards of a lunatic asylum. The benefits to be derived, even in idiot cases apparently hopeless, from a distinctive system, and from persevering endeavours to develop the dormant powers, physical and intellectual, are now so fully established, that any argument upon the subject would be superfluous.'

The Special Committee on Idiots and Imbeciles and Harmless Lunatics, who met in London in the summer of 1876, at their sixth meeting, after discussion, passed the following resolutions :—

'1st. That the treatment of adult idiots and imbeciles must depend upon the degree in which the character and faculties have been developed by previous education and training.

'2nd. That a small proportion may be permanently improved, so as to take care of themselves, either at their own homes or elsewhere, and to earn their own living.

'3rd. That a larger proportion may be improved, so as to support themselves under proper safeguards.

4th. But that there is also a large proportion of cases which, having achieved a certain improvement, are unable to

get beyond this, and are, indeed, liable to retrograde, and for these suitable institutions are indispensable.

'5th. Not only can idiots and imbeciles in asylums be employed with advantage to themselves, and the asylum be managed as industrial establishments for manufacturing or agricultural industry, but it is essential to the moral and mental well-being of the class that such a system should be adopted; and, under good management, it may be made advantageous to the institutions in a financial sense, by diminishing the cost of maintenance.'

Attempts have been made to have schools in lunatic asylums for the poorer and less educated classes, but nowhere with the same success as at the Richmond Asylum Schools, near Dublin, under the charge of the late Dr Lalor.* In this asylum six teachers were engaged, and fully one-fourth of the patients in the asylum—120 men and 130 women—attended school daily during the year 1874. I believe the same system is still maintained by the present superintendent, Dr Conolly Norman.

I have also been informed that the educational treatment of lunatics is diligently carried on by Dr A. D. O. Finegan, at the District Asylum, Mullingar.

Backward and Deficient Children.

Merely backward children are widely distinct from idiots. They are of slow growth, physical and mental, but are not usually deformed; they are late in walking and in speaking, but show no signs of brain disease. In the end they take up the functions of boys and girls, though later, and perhaps never become bright. The question what to do with children of inferior mental capacity has engaged some attention both

* On 'The Richmond Asylum Schools,' by D. Hack Tuke, M.D.—*Journal of Mental Science*, October 1875.

in this country and on the Continent. Such defective children have been studied with much skill and perseverance by Dr Francis Warner,* and the Report of a Special Committee upon the subject † now awaits the attention of our legislators. Being a member of the Committee appointed at the Annual Meeting of the British Medical Association at Glasgow in 1888, I made what inquiries I could in my own country, though I was unable to attend the meetings in London. The limits of this work prevent me expressing my views on this subject save in a brief form.

At Glasgow I said that if about 80 per cent. of the children in the country were taught to read and write, this was enough for all practical purposes. This sentence was copied into many newspapers, whether seriously or otherwise. I might have put it in another form : About 20 per cent. of our population never learn to read or write sufficiently well to hold and use these accomplishments. This being so, why should such children be forced and beaten, and their parents harassed to compass an object which never leads to anything? We ask too much when we try to drive all the children through the same mental drill. A dunce is a quite different boy from an imbecile. Children with healthy brains, however dull of function, are always far removed from those who have brains affected by disease. Some boys who never make anything of reading and writing, learn well enough to manage a boat, handle a spade, or drive a horse.

The Departmental Committee take the lowest stratum of school-life which they regard as 'a distinct class,' feeble-

* *Report on the Scientific Study of the Mental and Physical Conditions of Childhood, with particular reference to Defective Children.* London, 1895.

† *Report of the Departmental Committee on Defective and Epileptic Children*, Parliamentary Papers, vol. i. *The Report*, vol. ii. *Minutes of Evidence*, 1898.

See also, *Was können wir für den Unterricht unserer Schwachbegabten und Schwachsinnigen Kinder thun?* von Dr S. Kalischer. Berlin, 1897.

Feeble-minded Children in the Public Schools, by Will. S. Munroe, Westfield, Mass., 1897.

minded children 'who are not imbeciles.' When they come to define this new class we find that it has many of the traits by which we are taught to recognise imbecility, irregularity in bodily confirmation, malformation of the head, of the palate, tongue, lips, teeth, and ears, indications of the causes apt to produce mental feebleness, neurotic, strumous, epileptic, paralytic, syphilitic. In an appendix Dr Shuttleworth, whose skilled hand can be traced throughout the report, adds small-headed children, cretinous children, hydrocephalic, epileptic, and children of the Mongol type. The Committee estimates the number of such deficient children as about 1 per cent. of the ordinary school-attending children. Assuredly there are causes which produce extreme dulness in children without deep-seated disease of the nervous centres. For example, chorea, which is quite a curable disorder, is sometimes accompanied by much mental hebetude, and obstruction of the nasal sinuses by adenoid growth or chronic inflammations, what Dr Guye has styled aprosexia. This may render the child extremely stupid for the time. It appears to me that most of the children within this 1 per cent. do not differ from imbeciles save by a somewhat less degree of mental feebleness, and this can only be determined by testing the mental capacity. With those children sent to school there is really no practical difficulty. The teachers at any infants' school will soon make out whether they can learn or not, and will not be slow to point them out to any medical officer elected to examine them. In Sweden and Germany the rule is, if a child attends the auxiliary school for two years without making such progress that he can pass into the ordinary school, he is to be transferred to a school for the instruction of weak-minded children, or to an institution for idiots. I make no doubt that there is a large number of children upon whom our ordinary methods of instruction are wasted, and who, if they are to be educated out of the rates, should have special training. I should go as far

as Mr Munroe, who observes that such deficient children form nearly 10 per cent. of the whole public school enrollment. The mental dulness or distaste will be found to arise from a variety of causes. For such children there are already some special schools in London and in some of the large towns in England, and we are told that there are already schools or auxiliary classes for weak-minded children in thirty-eight towns in Germany. One danger is, that owing to the dislike of the parents to have their children sent to such schools, they may become little else than day schools for idiots, who will pass under the new term of feeble-minded.

CHAPTER XXI.

LAWS FOR IDIOTS AND IMBECILES.

Idiots in Pagan and Mahomedan Countries.

IDIOTS are rarely mentioned by Greek or Roman writers. By the laws of Lycurgus sickly or deformed infants were exposed in a glen of Taygetus; and from an allusion of Cicero * it appears that the laws of the Twelve Tables contained a similar enactment. The Institutes of Justinian provide that curators should be appointed for the imbecile and the deaf and dumb.

It appears that under the Empire the wealthy Romans kept dwarfs and fools for their amusement, and that some of these were imbeciles.

Seneca,† in one of his letters, mentions the death of a female imbecile (fatua), belonging to his wife. She was a hereditary burden, and had become blind. She thought the house was dark, and asked to be led out of doors, where she expected to find light. This delusion of the poor imbecile forms a text for philosophical reflection, otherwise it is not likely that her death would have been thought worthy of notice, for the Stoic says that he derived no amusement from the follies of the imbecile.

The greater respect for human life brought in by Christianity helped to save the lives of many idiot children. Montalembert, in his *Monks of the West*, tells us of Euphrasia

* *De Legibus*, iii, 8. See also *Plato de Republica*, lib. v, c. 9.
† *Senecæ Epist.*, 50,

the daughter of a Senator nearly related to the Emperor Theodosius, and the heiress of great possessions, who at the age of twelve retired into a nunnery in the Thebaid. Amongst her other good works are recorded her attention to sick children and to the poor idiots who were brought to the nuns as to the source of all remedies.

The following passage in the Koran * may refer either to insane persons or imbeciles, or to both :—'Give not unto those who are weak of understanding the substance which God hath appointed you to preserve for them ; but maintain them thereout, and clothe them, and speak kindly unto them.'

As the result of this sensible and kindly precept, the insane have been generally well treated in Mahomedan countries, and the Mussulmans can claim to have erected the first lunatic asylums.

Idiots may be seen wandering about in India, going everywhere unmolested ; and I saw one who was hanging about the tents nearly shot as a spy when we were marching down to Delhi before the siege. 'In the zenanas of modern India,' says Dr Wise,† 'it is usual to find at least one imbecile man or woman who is fed and clothed by the household, and whose incoherent, unintelligible talk excites wonder and amusement.' The Rev. Dr Horatius Bonar (in his *Days and Nights in the East*, remarks :—'A poor half-witted man, of middle age, we noticed going about quite at his ease, doing as he liked, nobody interfering, for insanity is *reverenced* as an *inspiration* in the East. More than once he went to an open-air coffee-house, or at least coffee-stand, set up beneath the gate for the refreshment of travellers, and helped himself to coffee and bread at pleasure, the owner of the refreshment-box looking on complacently as the poor idiot devoured his goods without offering one parâh in return.

* Sale's *Koran*, chap. 4.

† *Historical Notes on Insanity and on Asylums*, by James F. N. Wise, M.D., Calcutta, 1871.

*The Laws of England on Idiocy.**

The distinction between an idiot (*idiota a nativitate*) and a lunatic (*idiota a causa et infirmitate*) is of very old date in English law. Formerly the lord of the fee had the custody of the born idiot; but in the reign of Edward II, the King began to have the custody of the lands of natural fools, taking to himself all the revenue without waste or destruction, and finding them in necessaries and delivering the land to their heirs when they died. 'By the old common law,' says Blackstone, 'there is a writ *de idiota inquirendo*, to inquire whether a man be an idiot or not, which must be tried by a jury of twelve men; and if they find him *purus idiota*, the profits of his lands and the custody of his person may be granted by the sovereign to some subject who has interest to obtain them.'

'It generally happened,' adds Blackstone, 'that the jury, instead of finding an idiot *a nativitate*, found him only *non compos mentis* from some particular time, which had a very different operation in point of law.' In the case of the idiot the Crown took all the profits of the estate; in the case of the lunatic the Crown acted as trustee, to protect his property and to account to him for all profits received if he recovered, or to deliver them to his heirs if he died. The relatives had thus

* In writing this Chapter I have made use of the following works:—

The Law concerning Lunatics, Idiots, and Persons of Unsound Mind, by Charles Palmer Phillips, M.A., Barrister-at-Law: London, 1858.

A Treatise on the Medical Jurisprudence of Insanity, by J. Ray, M.D.: London, 1839.

The Lunacy Acts, &c., by Danby P. Fry, Barrister-at-Law, &c.: London, 1864.

The Medical Jurisprudence of Insanity, by J. H. Balfour Browne, Barrister-at-Law: London, 1871.

Bell's Dictionary and Digest of the Law of Scotland: Edinburgh, 1861.

The Law of and Practice in Lunacy, by A. Wood Renton, Barrister-at-Law, London and Edinburgh, 1896; an able, learned, and complete work.

a greater interest in getting the person affected declared a lunatic, or *non compos mentis*, since they did not thus lose sight of the profits of the estate.

The king generally gave his custody of the idiot or lunatic to some persons called a committee, but afterwards he vested it in the Lord Chancellor.

By the Acts 16 and 17 Vict., c. 70, and 25 and 26 Vict., c. 86, idiots and insane people were put in one class under the definition of lunatics, which was construed to mean 'any person found by inquisition, idiot, lunatic, or of unsound mind, and incapable of managing himself and his affairs.'

Mr Phillips * thus defines these terms :—

'It will appear from the authorities cited below that the proper sense to be attached to each of the above phrases has been fully considered and positively determined. We may, therefore, lay it down that every person whose mind from his birth, by a perpetual infirmity, is so deficient as to be incapable of directing him in any matter which requires thought or judgment, is in legal phraseology *an idiot.*

'Every person *qui gaudet lucidis intervallis*, and who sometimes is of good and sound memory, and sometimes *non compos mentis*, is in legal phraseology *a lunatic.*

'Every person who, by reason of a morbid condition of intellect, is incapable of managing himself and his affairs as an idiot or a lunatic, not being an idiot or a lunatic, or a person of merely weak mind, is in legal phraseology *a person of unsound mind.*

'*Non compos mentis* is the legal generic term which includes the three several classes just mentioned.'

Tests have been proposed by lawyers to help in defining idiocy, such as the capacity of the alleged idiot to count twenty pence or to tell his age, or who were his father and

* *Op. cit.*, p. 1.

mother. Of such suggestions Hale observed that 'they are too narrow and conclude not always, for idiocy or not is a question of fact triable by jury, and sometimes by inspection.' As Mr Wood Renton observes: 'The question would be determined in doubtful cases by the capacity of the alleged idiot, with reference to the particular matter or class of matters which brings his mental condition *sub judice*. Those born deaf and blind, and deaf-mutes, are in law presumed to be idiots; but the presumption may be rebutted in the case of either of those classes, by proof of the capacity of those persons to receive instruction.'

The idiot has no civil rights. He cannot convey property, nor marry, nor appear at law by attorney, though a lunatic may. The idiot must appear in person, 'and even when an attorney is employed for them the idiot should be described as appearing in person, or by guardian, according to the nature of the case' (Browne). An idiot cannot exercise the suffrage, nor be elected a member of Parliament. In a case of rape the protection accorded to female children is not extended to adult female idiots, for there is a probability of consent, and indeed a possibility of solicitation which cannot be admitted in little girls.

It is generally stated that an idiot cannot appear as a witness, and this must hold good with idiots of very deficient intellect, but when they can observe and relate what they have observed, it does not seem clear that their evidence would be totally rejected in a court of law. In the case of R. *v.* R. Perkins, writes Mr Browne Alderson, B. said—'It is certainly not the law that a child under seven cannot be examined as a witness. If he shows sufficient capacity on examination, a judge would allow him to be sworn.' 'In many respects idiots are to be regarded as children, and their evidence, where it is unsatisfactory, will have failed in its value in virtue of the same, or similar qualities, which

takes from the excellence of the testimony of very young children.'

Moral Responsibility.

The moral responsibility of idiots is so like the moral responsibility of children that it is needless to enlarge upon the subject. An idiot, or an imbecile, for example, may understand that it is wrong to beat a companion, or to steal, or to break windows, without being able to understand the moral guilt of forgery or of smuggling; or he may simply know that he is liable to be punished if he steals or breaks windows, without comprehending that there is anything beyond the mere will of the person set over him which renders punishment advisable.

The Lunacy Laws not made for Idiots.

As long as idiots had no property, or did not offend the law, or fall upon the poor-rates, the old code took very little notice of them. They were rarely shut up in lunatic asylums, and were left very much to the mercy of their relations or guardians, legal or accidental; but when they became to be treated as lunatics they began to suffer from the thoughtlessness or ignorance of our legislators. The Lunacy Acts were really framed with an eye to insane people alone, and idiots were thrown into the bargain as something not worth special notice. Hence, when by the exertions of men both eminent for their benevolence and their knowledge of the treatment of the different phases of mental derangement, attempts were made to separate idiots from the insane and to give them a special treatment, the state of the law interposed a great difficulty. To send a weak-minded child into a training-school, it was necessary to go through the long and formidable array of legal and medical certificates necessary to imprison a lunatic in an asylum, and the time of the

superintendents was needlessly eaten away with making out the manifold returns, which, necessary or superfluous in a lunatic asylum, were useless and unmeaning in a training-school for idiots. Such restrictions only served to deter parents from sending the most educable cases into the only institutions where they could get a fit education, and to thwart the noble philanthropy of their founders and supporters.

The most grievous hardship which idiots suffer from these enactments is their imprisonment in lunatic asylums.* Naturally gentle and timid, they are shut up in the same wards with the insane, people subject to furious fits of passion and dangerous delusions, and whose conversation and example are often very suggestive of evil. From their imitative tendencies they soon learn all the shameless indecencies brought before their eyes. They pick up oaths and imitate the wild manners of the insane. The medical

* In 1886 circulars were sent by a Committee of the Medico-Psychological Association to the Superintendents of all the asylums in England and Wales, to inquire into the number of idiots and imbeciles, and we got replies from about one-half of them. From these returns it appeared that in 1886 there were, in fifty-two asylums for adult lunatics, 206 idiots and imbeciles under fifteen years of age, and 2138 above that age. Leaving out the Metropolitan Asylum, which holds its existence under a special enactment, there were found to be in England and Wales, receiving proper training, 466 idiots and imbeciles under fifteen, and 936 above that age. In the Metropolitan Asylum of Leavesden for chronic and harmless lunatics and epileptics, there were 774 idiots and imbeciles above fifteen, and none under that age. But scanty information could be gleaned as to the number of idiots and imbeciles in workhouses. Dr J. A. Campbell found that there were 84 congenital imbeciles in twelve workhouses in Cumberland and Westmorland. In Dorsetshire there were in January 1886, in fifteen workhouses, 84 idiots and 38 imbeciles. In workhouses in Hants there were known to be 127 idiots and imbeciles, 55 males and 72 females. In the annual report of the Somerset and Bath Asylum there are stated to be 251 idiots, 124 males and 127 females, in seventeen workhouses.

In Dartford Workhouse there are 21 idiots and imbeciles; in Oxford, 12 above fifteen; in Headington, seven above that age; in Hereford, 28 idiots and imbeciles in the neighbouring workhouses; in Sedgefield Union Workhouse, five idiots and imbeciles; in the Colchester Workhouse there are about 45 idiots. See my paper 'On the Admission of Idiotic and Imbecile Children into Lunatic Asylums,' in the *Journal of Mental Science*, July 1886, and also January 1887.

superintendents would gladly get rid of them, but have no power to refuse them, for there are always medical men to certify that they are idiots, and fit persons to be detained in a lunatic asylum.

In 1875 the subject was taken up by the Charity Organisation Society of London. Its method of action was to nominate special committees, composed in part of members of the Society's Council, and in part of persons specially acquainted with the subject to be considered. The Committee appointed to consider what could be done for the care and education of idiots and imbeciles comprised a number of men of distinguished rank and services, combined with others known to have devoted much attention to the subject under consideration.

In considering what has been done, and what is proposed to be done, for the care and training of lunatics, I quote largely from the Summary and Agenda composed by Sir Charles Trevelyan for the use of the Committee appointed by the Council of the Charity Organisation Society in 1875, and also from the admirable Report,* also drawn up by Sir Charles Trevelyan. After stating the number of idiots and imbeciles as one in every 771 of the population, the Report shows that—

'The provision as yet made for this unhappy class of our population is totally inadequate. More than 10,000 are scattered in union houses, where they cannot receive the training and supervision they specially require, and often seriously interfere with the comfort of the other inmates, meeting, in return, with ridicule and unkindness. A large number are in lunatic asylums, where they are bewildered by the delusions of the insane, or alarmed at their ravings;

* 'Education and Care of Idiots, Imbeciles, and Harmless Lunatics.' Report of a Special Committee of the Charity Organisation Society, presented to the Council, January 15, 1877. Longmans: London, 1877.

and, owing to their imitative propensities, they are made worse than they were before. Others remain at their own homes, where they can only in rare instances obtain the education and treatment suited to their condition, while too often they are grossly neglected.

'Private charity has proved unequal to the task. Afflictions of this class can only be effectively dealt with as a common burden by public administrative arrangements. As they prevail in a certain fixed ratio to the whole population, the means of mitigation or remedy should be provided, not merely at favoured points like the metropolis and a few large towns, but generally throughout the country. They also affect all classes of society in nearly an equal degree; so that, while the removal of an imbecile member of a struggling working-class family is a necessity, there is no family so wealthy to whom it is not an object to secure for such a member the best scientific treatment, with a public guarantee of proper supervision. The machinery required to provide for this class of cases in every part of England is also so expensive, and so dependent for its efficiency upon proper organisation and inspection, that although much incidental aid may be obtained from private benevolence, the necessary buildings and establishments cannot be set up and maintained in working order by any power short of that of the entire community.

Legal Provision for Idiots and Imbeciles in England.

In England the legislation bearing on the provision for idiots and imbeciles may be briefly stated as follows:—

'Under the Lunatic Asylums Act (16 and 17 Vict., c. 97, sec. 2), the Justices of every county, and (with certain exceptions) of every borough, are bound to provide an asylum "for the pauper lunatics thereof;" and by section 132 of the same Act, it is expressly enacted that the word "lunatic" shall mean

and include "every person of unsound mind, *and every person being an idiot.*" In any case of default, the Home Secretary, on the report of Commissioners in Lunacy, is empowered, by section 29, to require the Justices "to provide a fit and sufficient asylum for so many pauper lunatics, as, upon the report of the Commissioners, he may think fit and direct." These provisions refer to one asylum; but, under section 30, the Justices are empowered to provide additional asylums where necessary, and the Home Secretary, on the report of the Commissioners in Lunacy, is likewise empowered to require the Justices to do so, in the event of default on their part.

'The Poor Law Amendment Act of 1834 (4 and 5 Will. IV, c. 76, sec. 45) prohibits the detention in any workhouse of any *dangerous* lunatic, insane person, or *idiot,* for any longer period than fourteen days; and the Lunacy Act of 1862 (25 and 26 Vict., c. 111, sec. 20) provides that no person shall be detained in any workhouse, being a lunatic or alleged lunatic (and the term "lunatic" here includes an "idiot"), beyond the period of fourteen days, unless the medical officer of the workhouse shall certify that such person is a proper person to be kept in a workhouse, nor unless the accommodation in the workhouse is sufficient for his reception.'

'By the Poor Law Act of 1844 (7 and 8 Vict., c. 101), the Local Government Board may combine any number of country unions and parishes into school districts for the management of any class or classes of infant poor not above sixteen years of age; and children may be sent from parishes not combined if within twenty miles. The largest powers are given to build schools, provide necessaries, and pay out of a common fund.

'By the 19th clause of a Bill recently submitted to Parliament by the President of the Local Government Board, the provision in the 14th section of the Poor Law Amendment Act, 1849, which enables guardians to contract to receive in

their workhouse certain paupers chargeable to some other union or parish, is proposed to be extended to the managers of a district or other asylum for the reception of paupers, and to every case in which the Local Government Board shall give their consent.

'By the Acts 25 and 26 Vict., c. 43, and 31 and 32 Vict., c. 122, poor-law guardians may, with the consent of the Local Government Board, send pauper idiots to any institution for the reception and relief of idiots maintained at the charge of the county rate or by private subscription, or to any other union house where special arrangements have been made for the same purpose, paying their full cost therein.

'But by far the most effective legislation which has taken place on this subject is the Act 30 Vict., c. 6, under which the managers of the Metropolitan Asylums District have the power, under the direction of the Local Government Board, to establish asylums for the sick, insane, and infirm, at the cost of the Metropolitan common poor fund. These powers have been acted upon, greatly to the public advantage, by the transfer of the imbeciles and idiots from the Metropolitan workhouses and lunatic asylums to the Caterham, Leavesden, and Hampstead Idiot Asylums, and by the arrangement subsequently made for separating the children, and educating them in a training-school at Clapton, pending the completion of a more perfect building at Darenth, near Dartford, for five hundred children, at an estimated cost of £75,000. In short, this branch of social adminstration has been satisfactorily provided for, not only by law but also in fact, as regards the great Metropolitan population; and the question for consideration appears to be whether this arrangement may not be extended to the rest of England, with such modifications as local circumstances may require, so that the idiots and imbeciles in each county or union of counties may be separately cared for in asylums or training-schools maintained out of

the rates—a portion of the expense being recovered from the relatives when they are able to pay, and capitation-grants being made from public funds for every pauper idiot so maintained.'

The report then refers to almshouses of charitable institutions where admission can only be obtained through a tedious and expensive canvas or a payment of board impossible to the lower tradesmen or upper artisan class.

The Committee held sixteen meetings, during which every difficult question connected with the subject was carefully considered and discussed. The following contains the principal resolutions passed :—

'1st. That idiots and imbeciles should be treated distinctively from other classes.

'2nd. That they ought not to be associated with lunatics in asylums.

'3rd. That they ought not, unless in exceptional cases, to be associated with paupers in union houses.

'4th. That the distinctive treatment suited to idiots and imbeciles ought to be applied collectively, especially in the earlier stages of education.

'5th. That idiots and imbeciles cannot with advantage be placed in ordinary schools with other children.

'6th. That the improvement of idiots and imbeciles would not be promoted by boarding them out; but in certain cases boarding out, under proper supervision, is not unsuitable to harmless lunatics.

'7th. That the education of idiots and imbeciles should be based on physical considerations.

'8th. That the education of idiots and imbeciles should commence at the earliest age at which they can dispense with a mother's care, and the subsequent stages should depend upon the capacity developed by them.

'9th. That idiots and imbeciles should have a thorough

industrial training, so as to enable them, as far as practicable, to support themselves, or at least to contribute towards their support, when circumstances render it necessary; and—

'10th. That idiots and imbeciles of all classes should, as far as may be prudently done, be also encouraged to cultivate any literary, scientific, artistic, or mechanical faculty they may happen to possess, or be otherwise furnished with employment, so as to promote their self-respect, and to make them feel that they are of some use in the world, or, at any rate, to occupy them pleasantly.'

The deliberations of the Committee and Sub-committee resulted in the drawing up of a report, on which it was intended that a Bill should be introduced into Parliament to extend the provisions of the Act 30th Victoriæ, cap. 61, brought in by Mr Gathorne Hardy for the metropolis, to the whole of England. It was proposed to take young and educable idiots out of poorhouses and lunatic asylums, and send them to institutions where they should be suitably educated and trained; that these training-schools should be supported partly by local and partly by imperial rates, and that they should be under the charge of governing bodies composed of representatives of the local guardians and magistratures and of persons appointed by the Crown. The committee also recorded their opinion—'That families which, although able to pay their way under ordinary circumstances, would be reduced to destitution if required to defray the entire cost, should be charged at such rates as their means will allow for an idiot, imbecile, or harmless lunatic member admitted into a training-school or asylum; and that the privilege accorded by Act of Parliament to the blind and deaf and dumb—viz., that relief given to children should not be deemed to be parochial relief given to their parents—should be extended to idiots, imbeciles, and harmless lunatics.'

The difficulties connected with the disposal of grown-up idiots are thus met by the Committee :—

'After the period of training a few may be returned to their own homes as cured, and will become merged in the mass of the population. A large number may be employed, as they often now are, under the superintendence of members of their own family or other persons entrusted with their care, in various handicrafts, in doing the rough work of large households, in gardening, and even in ordinary agriculture and manufactures. Another field of employment for weak-minded men and women is the washing and other domestic service of public institutions, including the idiot asylums themselves and lunatic asylums and union workhouses, care being taken that only suitable cases are selected for the purpose, and that proper regulations are laid down for their protection. But after making all these deductions, a large proportion of the young persons who have passed through the training-schools will prove unfit to be restored to society, even under these modified conditions, and for them adult custodial asylums must be maintained, at which they may be permanently cared for in the most economical manner, with the advantage of constant medical supervision. But such is the sustaining, healing influence of regular employment, that even the adult asylums ought, as far as possible, to be managed on the principle of industrial establishments, having gardens, farms, and workshops of various kinds connected with them, to one or other of which every patient capable of doing anything should be attached. Such a system, properly carried out, would diminish the expense of the institutions, and, while the individual cost would be less than it can be in scattered workhouses, the most scientific and humane treatment would be secured. Training-schools and adult asylums, however they may differ in their internal arrangements, have mutual relations which often make it desirable that they

should be in each other's neighbourhood, and under the same general superintendence. Cases differ so much in their circumstances that no general rule can be laid down as to the age at which the education of idiots can be said to be completed, and there ought therefore to be the utmost freedom of communication between those who are charged with the management of the juvenile and adult institutions, and a large discretion should be allowed as to the age at which the pupils should leave the juvenile institutions.'

It was also proposed that adult idiots, imbeciles, and harmless lunatics should be separated from the ordinary insane and sent to custodial asylums.

The objections likely to be made on the score of increased expenditure are thus met:—

'For the most part, what is proposed is not to impose a new burden upon the public, but to provide in a more satisfactory and absolutely essential manner, in separate training-schools and custodial asylums, for persons whose maintenance is already chargeable to the rates and public funds; and so far as the benefits of the system may be extended to a class above the destitute poor, the assistance given will be wholly or partly paid for by the families concerned, according to their ability. Owing to the overcrowded state of the lunatic asylums, new buildings are imminent in many counties, and the real question for consideration is, whether the existing asylums should not be relieved from this unnecessary burden, and the additional accommodation should be provided according to an improved classification, consistent both with administrative economy and with the well-being of every class of the insane. The committee especially rely upon the systematic training proposed to be given to idiot children for the means of reducing the expense to the nation. Whatever may be the cost of educating them, the cost of neglecting them is greater still. They must be

supported in idleness, misery, and mischief, if they are not taught to work.'

In the asylum at Darenth for London pauper idiots and imbeciles, the children are not under any lunacy certificate whatever, nor is any notice of their admission sent to the General Lunacy Board. The medical officer of the workhouse certifies that the person sent is, in his opinion, a chronic and harmless lunatic, idiot, or imbecile, such as might lawfully be retained in a workhouse, and a fit person for admission into the Metropolitan District Asylum. This is confirmed by a member of the Board of Guardians, generally the chairman or vice-chairman.

There are now in the Darenth schools and pavilions about 1000 patients all withdrawn from the homes of the London poor, and, in a separate building, about 1000 grown-up idiots and imbeciles of the London poor. What a vast amount of diffused misery is thus relieved. It is difficult to believe that those who talk churlishly or contemptuously of this new offshoot of Christian charity have fairly considered what they are talking about. In some quarters there seems a revival, at least in words, of the hard-hearted features of paganism. I have heard people say that all idiot children should be drowned; on the same principle all chronic lunatics should be shot; and I have read a pamphlet, very well written, in which it was argued, on Malthusian principles, that every third child should be put to death. This proposal was apparently made in good faith, without any of the ghastly humour which made Dean Swift propose that the children of the Irish poor should be killed and eaten; but if society saves idiots from being drowned in infancy, it should also see that they are not drowned in neglect, squalor, and misery. Idiocy or imbecility in the children, striking at the root of wishes and hopes very dear to the human heart, is a sore and life-long grief to parents; but when it appears in a poor and

struggling family, and, as not unfrequently happens, visits two or three children in succession, it brings so many miseries and hardships upon the family, that every man who has got a kindly heart ought to be willing to do a little to help them.

It became a question of some moment whether the pupils should be transferred to the custodial asylums when they reached an adult age, which was fixed by the Local Government at sixteen years. In that case, their special education would come to an end before they had learned enough to be able to contribute to their own maintenance. Imbeciles, as we have seen, are in general delicate and slow of growth; and, as their intelligence requires much cultivation before they can be put to a trade, fourteen may be considered an early age for them to begin to hold a plane or handle a spade, or even to be seated at tailoring or brush-making. Five or six years are usually required for an ordinary apprenticeship to such trades. How then can it be expected that imbecile boys should learn any work worth the trouble of teaching from fourteen to sixteen? Imbecile girls, too, cannot be taught to work so as to be servants, save by the steady application of a good many years after they have become strong enough to do some work. At first they are far too childish and trifling, and their system is too ill-developed to allow them to be put to any hard work. For these and other reasons, it seems best that no strict rules should be made for the withdrawal of pupils from the training-schools at fixed ages, though they might be early enough for persons of normal growth.

Institutions for idiots should be of two kinds, educational and custodial; and, as a general rule, adults should not be allowed to be too numerous in the training-schools. A few, on the other hand, are useful there in doing work they have got accustomed to, and in watching and encouraging the younger ones. Grown-up imbecile girls, too, are very useful

in looking after the younger children, with whom they have a certain community of feeling. They form a desirable link between the younger children and the paid nurses. They are much more willing to remain beside the children, and many difficulties have been tided over, and many accidents have been avoided by their affectionate care.

With many idiots and imbeciles puberty is late, sometimes not at all ; but in most cases it is better that asylums for adults of different sexes should be in separate buildings.

Through the persevering representatives of the managers of some English Institutions and others interested in charitable efforts there was passed through Parliament the Idiots Act of 1886, which provides that any idiot or imbecile while a minor may be placed by his parents or guardians in any hospital, institution, or licensed house, specially designed for the care and education of this class, on a formal certificate of his infirmity given by a registered medical practitioner ; after the age of twenty-one years, he may still be continued under care by a certificate of a medical practitioner accompanied by a statement of his parents or guardians. This detention, however, requires the written consent of the Commissioners in Lunacy, who have also power to set free such persons, stating their reasons for so doing. The Commissioners in Lunacy are empowered to grant licenses to the managing committee, or principal officer of such establishments ; they may also, by order in writing, direct that a duly qualified medical practitioner shall reside in every hospital, institution, or licensed house ; they ought to inspect it once a year ; and notices of admissions, discharges, and deaths should be sent to them. Idiots or imbeciles do not include lunatics ; that is, no one should keep lunatics under cover of a license for training idiots or imbeciles. This Act was a most salutary relief from the shackles of the Lunacy Acts. Every board seems willing to extend its powers, and reluctant to lose

them. The English Commissioners are already anxious to regain powers over institutions for idiots, but unless they can prove that the Act has been abused, it is to be hoped that it will not be altered.

Laws of Scotland on Idiocy.

The old law of Scotland* distinguishes between natural fools, idiots, and furious persons ; and the nearest agnates or by the father's side of idiots were made their tutors or curators, after the disposition of the Roman Law. This was done by taking out a brieve of idiocy, and bringing the case before a jury to inquire as to the fact of the idiocy or insanity, and settle who was the nearest agnate of twenty-five years of age. The powers of the curators to an idiot were the same as those of tutors to pupils, and the curatory expired either upon the death of the person cognosced or upon his recovery, the latter event being certified by a declaratory judgment of the court. The expenses of cognition were so great, that the process was never gone through, save when the idiot was likely to fall heir to property enough to pay for it, but by the Act 43 and 44 Victoriæ, cap. iv, power is given to the Sheriff and Sheriff-Substitute to appoint judicial factors on estates the yearly value of which does not exceed £100. The sovereign, as *pater patriæ*, was guardian both of idiots and of furious persons, standing to the latter in the position of a mere trustee, since their recovery is never despaired of. The guardianship was generally delegated to subjects. At present the care of an idiot's property is left in the hands of relations. Bell tells us that in Scottish law a distinction is taken between an absolute idiot and a person with some sparks of reason. The latter, it is said, may, without the consent of curators, execute deeds of lesser moment.

* James III, par. 8, cap. 66 ; James VI, par. 10, cap. 18.

The law of Scotland divides people into three classes, according to their ages. A girl ceases to be a pupil or child, and passes into the stage of puberty at twelve; a boy at fourteen. From this period up to twenty-one they are called minors, after which they become of lawful age. The tutor acts alone, the pupil having no person in law, while the minor acts with the advice and consent of the curator. A person who is an absolute idiot is in the same position as if he were a perpetual pupil. He is incapable of having a settlement in his own right, and therefore takes the settlement, if legitimate, of his father, or if illegitimate, of his mother. This rule, however, does not apply to one who is merely imbecile, who may earn wages and thus acquire a settlement of his own.

A person who having reached puberty becomes an idiot, is chargeable against the parish in which he himself has acquired a settlement, and failing his so having acquired a settlement he is chargeable to the parish of actual birth.

The old law viewed an idiot as one who should remain a child for life. The new Lunacy Acts, treating the idiot as a madman, made a retrograde step, and inflicted much injustice upon a helpless and innocent class.

According to the Poor Law Act of 1845, while 'insane or fatuous poor persons should be sent to an asylum, poorhouses are of use for providing for those persons who, from weakness or facility of mind, or by reason of dissipated and improvident habits, are unable or unfit to take charge of their own affairs.

This clause is still in force. Such persons, indeed, form a considerable proportion of the inmates of poorhouses, though some of the governors of these establishments avail themselves of the Lunacy Acts to oppose the entry of imbeciles though not certified as lunatics.

In the Act of 20th and 21st Victoriæ, the word 'lunatic' means and includes 'any mad or furious or fatuous person,

or person so diseased or affected in mind as to render him unfit, in the opinion of competent medical persons, to be at large, either as regards his own personal safety and conduct, or the safety and property of others, or of the public.

In the form of order to be granted by the sheriff for the reception of a lunatic, it is provided that one may say that the person to be committed 'is a lunatic, or an insane person, or an idiot, or a person of unsound mind.'

In the 25th and 26th Victoriæ, the word 'lunatic' means and includes 'every person certified by two medical persons to be a lunatic, an insane person, an idiot, or a person of unsound mind.' Idiots have consequently been treated as lunatics, and have been shut up in lunatic asylums along with them, without any separation or attempt at separate treatment. Some of these idiots no doubt are unmanageable, inveterate in their bad habits, and vitiated by persecution and vile example; but others are of tender years, docile, and educable.

In the same Act there is a clause (vii.) in which it is said: 'It shall be lawful for the Board to grant licenses to any charitable institution established for the care and training of imbecile children, and supported in whole or in part by private subscription, without exacting any license fee therefor; and such license may be in name of the superintendent of such institution for the time being.'

In this clause it will be observed that the word imbecile is used and not idiotic. The meaning of the word is not defined in the Act. Mr Wood Renton writes that imbecility of mind is 'weakness between the limits of absolute idiocy on the one hand and of perfect capacity on the other.'

This clause, passed in 1862, was used by the institutions for imbeciles at Larbert and Baldovan. No sheriff's order nor certificate of lunacy was required, though notification of the admissions, discharges, and deaths were sent into the

General Board of Lunacy, and the Institution was inspected by the visiting commissioners. At Larbert, from the beginning, a considerable proportion of pupils could not be called children in respect of their age, but the proportion of such cases did not become greater.

But owing to the want of a custodial asylum there was a great difficulty about the disposal of some pupils who had grown up in the institution, if their parents were dead, or if they had to go into miserable homes, situated in bad neighbourhoods or poor localities. Some of our pupils, too, had parents or relations who were not very fit to look after them, while others were incapable, from poverty, of doing so. Others were found very useful in the establishment in teaching and training, and watching over the rest. Thus matters went on from 1862 to 1876, when the Board of Lunacy declared that the Superintendents of Larbert and Baldovan had no legal power to keep pupils in the house beyond the age of eighteen years.

There was difference of opinion as to the law of the case, but it ended by the directors of Larbert and Baldovan removing their pupils above eighteen, many of whom soon fell into lunatic asylums.

It has been quoted as an axiom in law, that no one can be detained anywhere save under some warrant; and that when imbeciles or idiots cease to be children, they can no longer be detained by the consent of their parents or guardians; and as they cannot give a legal consent, some formal arrangement is needed. In point of fact, imbeciles requiring such care have not ceased to be children, and this is precisely the reason why they cannot give a legal consent.

The Parliamentary grant of 4s. a week has been allowed to idiots or imbeciles sent to a training-school, such as Larbert or Baldovan, just as to a lunatic asylum; but the Board of Lunacy have required that these children should be certified

as of unsound mind by two medical persons, which is equivalent to a certificate of insanity.

It strikes us that it would have suited all purposes to get them certified as idiots. The Scottish Lunacy Board appear to hold that the phrase 'of unsound mind' includes all the other definitions, insane, lunatic, idiot, and even imbecile.

By the present laws, to imprison idiots in a lunatic asylum is made too easy; to keep them in a training-school is made too difficult.

To sum up in the words of the Special Committee of the Charity Organisation Society, who carefully examined the question—'In Scotland there is the same mixing together of lunatics and idiots, to the serious injury of both, and the same absence of any legal provision for training juvenile idiots and imbeciles, all which has arisen from the laws having been passed when the essential differences between lunatics and idiots were not understood or acknowledged.'

As far as my experience goes, the difficulty of detaining imbeciles is a mere speculation. I never had occasion to detain such a patient against his will, and my doors and gates are only closed at night. As, however, idiots are a defenceless class, it is a great benefit that there should be an officer appointed by government to visit such boarders all over the country, and see that they are not neglected or maltreated. With a disposition to do the best for this unfortunate class there would be no difficulties to proper legislation. I have written a good deal on this question,* which has been little attended to in Scotland, and which need not be repeated out of it. What I should specially advocate is the extension of the Idiots Act to Scotland, so that there should be no difficulty in the

* See *Idiocy and Imbecility*, p. 362, and papers in the *Journal of Mental Science*, especially—'Notes on Asylum for Imbecile Women at Newark, U.S.A.' vol. xxvi, p. 216; 'Notes from Soethre's Institution for Imbecile Children near Bergen, xxxiv; 'Visits to Danish Asylums for the Feeble-minded and other Institutions,' January 1898.

erection of training-schools for all classes. I hold that the laws should forbid all idiotic or imbecile children being sent to lunatic asylums, unless insanity of a dangerous or destructive character had supervened upon the original malady; and when such superadded insanity had subsided, they ought to be discharged from the lunatic asylum, nor be allowed to be detained upon the ground of the original idiocy or imbecility alone. No grown-up idiot or imbecile should be confined in a lunatic asylum, unless dangerous to the community or to himself, or manifesting habits grossly repugnant to decency. The only public provision for this class in Scotland consists in two asylums ostensibly for imbecile children alone. On being discharged, or turned out after the five years' time of a voting charity, happily the only one north of the Tweed, these unfortunates, unless cared for by their parents, mostly find their way into the lunatic asylums, where they soon unlearn all they have been taught, and rapidly imitate the worst practices of lunatics. It certainly shows a wonderful apathy that no attempt has been made to establish a custodial asylum for idiots in Scotland.

I can see no advantage in associating harmless lunatics with idiots or imbeciles. In the first place, it is very difficult to make out what a harmless lunatic is. In the concluding stages of dementia or general paralysis they may be fairly called harmless, but such cases should not be removed from ordinary asylums for the insane; even taking the most favourable specimen of the harmless lunatic, it is difficult to see what either he or the idiot could gain by being associated together. The boarding-out system seems, as far as it goes, to do well for those harmless lunatics for whom the confinement of an asylum seems too rigid.

The Provisions for Idiots in Ireland.

These were, as Mr Jonathan Pim wrote in 1864, simply that

they may be confined in lunatic asylums as being insane, or in prison as criminals, or in workhouses as paupers. No change has taken place since, except the establishment of the Stewart Asylum, in which there are at present about sixty inmates. There is a statute permitting the erection of provincial asylums for imbeciles which might have been utilized, but nobody has thought it worth while to set the machinery in operation.

The condition is thus described in the Fortieth Report of the Inspectors of Lunatics in Ireland, 1891 : 'The existing lunacy laws were not made for imbeciles, and we find in Ireland no less than 418 of this unhappy class occupying in district asylums accommodation properly intended for different forms of insanity, mimicking the shameless indecencies which are brought before their eyes, their moral degradation completing their mental deficiency, while no less than 1888 are scattered over the workhouses, where the provision made for them is often inadequate, where their very presence exercises a painful and demoralising influence on the other inmates, and where in some cases they live in mechanical restraint to prevent their mischievous and destructive habits. The great majority, however, remain as hopeless wanderers, exposed to want and suffering, residing in homes where they can only in rare instances obtain the treatment suitable to their condition, while often they are grossly neglected.'

The Local Government (Ireland) Bill will affect a great change in the administration of lunacy in the island, and it is to be hoped that it will contain some provision for the better treatment of idiots and imbeciles when it passes into law.

'The kingdom of Saxony,' writes Dr Kind, 'was the first State in Germany to erect an institution for idiots ; and in the new Education Bill of 1873, it has been the first to make the instruction of the weak-minded obligatory. Section 4 provides that neglected children, those wanting in intellect,

weak-minded, and fatuous (imbeciles and idiots), are to be brought up in the public or private institutions provided for that purpose, if sufficient provision be not otherwise made by those whose duty it is to attend to it.

The education of idiots was made compulsory in Norway in 1891 ; it is also so in Anhalt and Schleswig-Holstein.

Laws in the United States.

In no country of the Old World are the claims of this helpless class more generously responded to than in North America. From the shores of the Atlantic to the surf of the Pacific Ocean, the education of the blind, the deaf, and the imbecile is supported by public grants. In the American Union there are nineteen States which have special institutions of their own for the feeble-minded, and nine States which send those that are destitute to asylums, orphanages and reformatories.* In fourteen States there are as yet no special provisions for the benefit of idiots and imbeciles. Twenty-four institutions are liberally supported by State grants ; some of these are custodial (as the Asylum at Newark, N.Y., for grown-up imbecile women, containing 386 inmates, and a similar one in New Jersey with ninety-four inmates), but most of these institutions are mainly educational, and the tendency is to select cases which exact less from the teachers and promise more, so that the pupils are generally less of the idiotic and more of the feeble-minded class than in Great Britain. The buildings are spacious and surrounded by a large acreage of ground, which allows farm works to be carried on. There is a good staff of teachers and facilities for teaching trades, and in directing the work the medical superintendents show both

* For the information above I am mainly indebted to a paper 'On the Present Status of the Feeble-minded,' read at the National Conference of Charities at Toronto, July 1897, by F. M. Powell, M.D., and *The Altruist*, New York, July 1897.

diligence and judgment, and important contributions to the literature of the subject come from them and from their assistants. In the older institutions the parents belonging to the well-to-do class pay a fixed sum representing the cost of board and education; but in the Western States no charge is made save from boarders who are sent from other States which have no institutions of their own. Besides this there are several excellent training institutions for the children of the wealthier classes who desire separate treatment. The beneficiaries of the State institutions are received on trial. By the regulations of most of them, children who are insane, paralysed, or extremely helpless are excluded. The same prohibition is made against epileptics, but this is scarcely carried out. If the children do not improve from training they are sent back to their homes, generally after a year's trial. Thus the relief afforded, though highly creditable to the States, is mostly bestowed upon those parents who bear the lightest burdens. That much remains to be done is evident from the subjoined table taken from *The Altruist*, but we doubt not that in time a much greater share of relief will be afforded to the parents of idiot children by the enlightened philanthropy of the citizens of the great republic.

Total number States with no adequate provision, . .	28
Total number of feeble-minded (probably), . .	150,000
Total number cared for in the 27 institutions, . .	6,000
Total number practically uncared for (probably) over	140,000

I have enjoyed many occasions of converse and correspondence with experienced medical superintendents in the States and elsewhere, and have found that they all agree in thinking that idiots and imbeciles should be under tutelage all their lives, and that they are best cared for in special establishments under the charge of those who have learned to understand their wants and shield their weaknesses.

I should like to have been able to add a full list of the

different training institutions for idiots and imbeciles over the civilised world, but the proposed limits of this work do not allow sufficient space for this. In *Idiocy and Imbecility* seventy-six such institutions were mentioned; I am sorry that the names of a few were omitted. I have now counted above two hundred training-schools and asylums for idiots and epileptics, so we may fairly conclude that the number of such institutions has more than doubled since the last twenty years.*

Preventive Legislation.

In 1895 a law was passed through the Legislature of Connecticut that no man or woman, either of whom is epileptic, imbecile, or feeble-minded, shall intermarry, or live together as husband or wife, when the woman is under forty-five years of age, and any person so doing shall be imprisoned for not less than three years. Anyone aiding or abetting in such a marriage shall be fined not less than $1000, or imprisoned not less than one year.

Every man carnally knowing a female under forty-five, who is epileptic, imbecile, or feeble-minded, or a pauper, shall be imprisoned not less than three years. The same punishment is to be inflicted upon epileptic men, and upon women under forty-five who give consent to men affected by such disabilities. The assumption of the Bill is that epilepsy, imbecility and pauperism are largely due to hereditary causes.

Pennsylvania records an Act of Assembly that no insane or feeble-minded person and no person epileptic from natural causes apart from accidental causes shall be capable of

* The reader who wishes information about the asylums in Germany should get the useful work of Professor Heinr Laehr, *Die Heil-und Pflegeanstalten für Psychisch-Kranke des deutschen Sprachgebietes im J.* 1890, Berlin, Georg Reimer, 1891. In Germany and German-speaking lands there are fifty-five training-schools for idiots, and twenty-eight for epileptics.

wedlock, and any person who shall knowingly solemnize or assist in such marriage shall be subject to imprisonment and a fine of 500 dollars, at the discretion of the judge.

I have no information about the working of these novel enactments. It has been repeatedly proposed in American Medical Journals that, in order to prevent the propagation of children likely to become idiotic or insane, persons who bear the marks of an undoubted neurotic heredity should be rendered sterile by surgical operation.

In 1896 it was enacted by the State Legislature of New York, that 'No idiot shall be received by or committed to any State Hospital for the Insane.'

British Colonies.

There is an excellent Asylum for Idiots at Orillia for the Province of Ontario, supported by the State, and in 1895 the Government of the Cape of Good Hope established an Institute for Imbecile Children at Grahamstown.

CHAPTER XXII.

WOLF BOYS.

An Inquiry into some Accounts of Children being fostered by Wild Beasts.

> Quis credat pueris non nocuisse feram ?
> Non nocuisse parum est ; prodest quoque.—OVID.

IT has been a question for curious speculation since man began to reflect on the origin of knowledge and the nature of his own faculties, what would be the character of a human being growing up without any intercourse with his kind, and having no ideas and no knowledge save those derived by his own unassisted intellect from his observations of the external world. Man's acquired knowledge being evidently the combined product of his own innate capacities, tastes, and sympathies, and the suggestions and customs resulting from his contact with other beings, it is only by a very difficult and somewhat doubtful process of analysis that philosophers have been able to distinguish what is innate and what is acquired ; and, as everyone knows, great discussions have taken place as to the line of demarcation between those ideas which are the result of education and those supposed to be of spontaneous growth. The experiment said by Herodotus * to have been performed by King Psammitichus is one likely enough to have been made by an Eastern prince addicted to those speculations on the origin of ideas which so naturally

* Herodotus, *Euterpe*, cap. ii, compare the remarks of Renan on this passage. *De l'Origine du Langage :* Paris, 1858, p. 30.

present themselves to human curiosity. In order, as the priests of Memphis told the great father of history, to decide the important question:—Which was the most ancient of nations?—the king gave two newborn children to a shepherd to educate. They were nursed by goats and separated from all human beings. The first sound they uttered was βεκὸς, and this on inquiry being found to be the Phrygian for bread, the Egyptians admitted ever after that the Phrygians were of more antiquity than themselves.

It is said that a similar experiment was repeated by the philosophical Emperor Frederick II, and by James IV of Scotland.*

Failing these rude experiments, which do not appear to have gained any satisfactory results, the curiosity of the learned has been directed to children found straying in the woods, deserted by their parents, and feeding like wild animals. A girl was caught at Soigny, near Châlons, in 1731, who afterwards went by the name of Mademoiselle Leblanc. When found she was mute, but after learning to speak she was able to give some account of her previous condition. She was very expert in climbing and swimming, and was said to have lived upon small animals and fish which she caught. She long retained a taste for sucking blood and eating raw flesh.

As late as 1798, a boy about eleven or twelve years of age was seen in the woods of Caune, in the department of Aveyron, in France, seeking for acorns and roots. He was caught by three sportsmen, and finally brought to Paris, where his education was undertaken by M. Itard,† Physician of the

* See *Chambers's Gazetteer of Scotland*, Edinburgh, 1833, article 'Inchkeith.'

† 'An Historical Account of the Discovery and Education of a Savage Man, or of the first developments, physical and moral, of the young Savage caught in the Woods near Aveyron in the year 1798,' by E. M. Itard, etc., London, 1802 In reading this pamphlet, plainly the work of a superior mind, one cannot fail to be struck with the subtlety of the analysis of the sensory and mental powers of this 'simple child of nature,' as M. Itard believed him to be, and the sagacity of

Deaf and Dumb Institution there. The result proved the correctness of Pinel's diagnosis that the boy was an idiot. This was also the case with Peter, 'the wild boy,' who was caught in the woods in Hanover in 1724. Blumenbach,* who investigated this case, says that Peter when found had still a rag of a white shirt tied to his neck. His legs above the knee were white, showing that he had not long before been wearing trousers, but no stockings or shoes. He was believed to have been the idiot son of a man called Krüger, thrust out of doors by a stepmother. Peter was brought to England to be placed under the care of Arbuthnot. His peculiarities have been described by Swift and Monboddo.

A still more curious subject of inquiry is afforded by stories of children, deserted by their parents, being fed and guarded by wild beasts. Everyone knows about Romulus and Remus being suckled by a she-wolf, which some of the ancient writers have gravely narrated as if worthy of belief.† Similar tales were told about the beautiful huntress Atalanta, who was exposed when a child and suckled by a she-bear, and of the Persian King Cyrus, who was exposed when an infant and nourished by a bitch. Professor Max Müller has expressed the opinion that the question whether children have ever been suckled, reared, and educated by wolves is one of considerable importance in the treatment of ancient myths. Some ancient stories, though incredible to us, are in themselves not impossible. Here it is absolutely necessary

the means used to educate his intelligence. The skilful preceptor overrated the mental capabilities of his pupil; but he has laid down a suggestive and valuable method of education, which has been of use in the training of idiots. This pamphlet has been lately republished in Paris under the title, *Rapports et Mémoires sur le Sauvage d'Aveyron, l'Idiotie et la Sourde-Mutité.*

* See the *Anthropological Treatises* of J. F. Blumenbach, translated by Thomas Bendyshe.

† See, for example, *Justinus Historiarum Philippicarum*, Lib. xliii, cap. 1, Sed Fortuna origini Romanæ prospiciens pueros lupæ alendos obtulit; quæ amissis catulis, distenta ubera exinanire cupiens nutricem se infantibus præbuit.

that the question of their physical possibility should be settled first, before we can place them in the category of the miraculous, and apply to them the proper tests for discovering mythical ingredients. Whether children, carried off by wolves, could be suckled and kept alive in a den for any length of time, is surely a question which students of natural history, and even practical sportsmen, might settle for us once for all.

The best authenticated story of this kind is given by Procopius.* During the Gothic war a woman in Picenum, having been either carried away or killed, her new-born child was left deserted. The infant was cared for and nursed by a she-goat. After the alarm had passed away, the neighbours returned and found the child, whom they named Ægisthus, after its foster parent. Procopius says he himself saw the child, and that those with him teased it to make it cry, when the goat, which had been a little distance off, came running up and stood over the child to protect it.

In General Sleeman's work upon Oude† there is a collection of cases of boys who were found in the woods in company with wolves, and who were believed to have been fed and taken care of by these ravenous beasts.

The description of the first of his cases is given as follows :—

'There is now at Sultanpoor a boy who was found alive in a wolf's den near Chandour, about ten miles from Sultanpoor, about two years and a half ago. A trooper sent by the native Governor of the district to Chandour, to demand payment of some revenue, was passing along the bank of the river near Chandour about noon, when he saw a large female wolf leave

* *De Bello Gothico*, Lib. ii, cap. 16.

† *A Journey through the Kingdom of Oude in* 1849-50, by Major-General Sir W. H. Sleeman, K.C.B., resident at the Court of Lucknow: London, 1858: vol. i, pp. 208-222.

her den, followed by three whelps and a little boy. The boy went on all fours, and seemed to be on the best possible terms with the old dam and the three whelps, and the mother seemed to guard all four with equal care. They all went down to the river and drank without perceiving the trooper, who sat upon his horse watching them. As soon as they were about to turn back, the trooper pushed on to cut off and secure the boy; but he ran as fast as the whelps could, and kept up with the old one. The ground was uneven, and the trooper's horse could not overtake them. They all entered the den, and the trooper assembled some people from Chandour with pickaxes, and dug into the den. When they had dug in about six or eight feet the old wolf bolted with her three whelps and the boy. The trooper mounted and pursued, followed by the fleetest young men of the party, and as the ground over which they had to fly was more even, he headed them, and turned the whelps and boy back upon the men on foot, who secured the boy, and let the old dam and her three cubs go on their way.

'They took the boy to the village, but had to tie him, for he was very restive, and struggled hard to rush into every hole or den they came near. They tried to make him speak, but got nothing from him but an angry growl or snarl. He was kept for several days at the village, and a large crowd assembled every day to see him. When a grown-up person came near him he became alarmed, and tried to steal away, but when a child came near him he rushed at it, with a fierce snarl like that of a dog, and tried to bite it. When any cooked meat was put before him he rejected it in disgust; but when any raw meat was offered he seized it with avidity, put it on the ground under his paws like a dog, and ate it with evident pleasure. He would not let any one come near him while he was eating, but he made no objections to a dog coming and sharing his food with him. The trooper remained

with him four or five days, and then returned to the Governor, leaving the boy in charge of the Rajah of Hassunpoor. He related all that he had seen, and the boy was soon after sent to the European officer commanding the First Regiment of Oude Local Infantry at Sultanpoor, Captain Nicholetts, by order of the Rajah of Hassunpoor, who was at Chandour, and saw the boy when the trooper first brought him to that village. This account is taken from the Rajah's own report of what had taken place.

'Captain Nicholetts made him over to the charge of his servants, who take great care of him, but can never get him to speak a word. He is very inoffensive, except when teased, Captain Nicholetts says, and will then growl surlily at the person who teases him. He had come to eat anything that is thrown to him, but always prefers raw flesh, which he devours most greedily. He will drink a whole pitcher of butter milk when put before him without seeming to draw breath. He can never be induced to keep on any kind of clothing, even in the coldest weather. A quilt stuffed with cotton was given to him when it became very cold this season, but he tore it to pieces, and ate a portion of it, cotton and all, with his bread every day. He is very fond of bones, particularly uncooked ones, which he masticates apparently with as much ease as meat. He has eaten half a lamb at a time without any apparent effort, and is very fond of taking up earth and small stones and eating them. His features are coarse, and his countenance repulsive, and he is very filthy in his habits. He continues to be fond of dogs and jackals, and other small four-footed animals that come near him, and always allows them to feed with him if he happens to be eating when they approach.

'Captain Nicholetts, in letters dated the 14th and 19th of September 1850, told me that the boy died in the latter end of August, and that he was never known to laugh or smile.

He understood little of what was said to him, and seemed to take no notice of what was going on around him. He formed no attachment to any one, nor did he seem to care for any one. He never played with any of the children around him, or seemed anxious to do so. When not hungry he used to sit petting and stroking a pariah or vagrant dog, which he used to permit to feed out of the same dish with him. A short time before his death, Captain Nicholetts shot this dog, as he used to eat the greater part of the food given to the boy, who seemed in consequence to be getting thin. The boy did not seem in the least to care for the death of the dog. The parents recognised the boy when he was first found, Captain Nicholetts believes, but when they found him to be so stupid and insensible, they left him to subsist upon charity. They have now left Hassunpoor, and the age of the boy, when carried off, cannot be ascertained, but he was to all appearance about nine or ten years of age when found, and he lived about three years afterwards. He used signs when he wanted anything, and very few of them except when hungry, and he then pointed to his mouth. When his food was placed at some distance from him he would run to it on all fours like any four-footed animal, but at other times he would walk upright occasionally. He shunned human beings of all kinds, and would never willingly remain near one. To cold, heat, and rain he appeared to be indifferent, and he seemed to care for nothing but eating. He was very quiet, and required no kind of restraint after being brought to Captain Nicholetts. He had lived with Captain Nicholetts' servants about two years, and was never heard to speak till within a few minutes of his death, when he put his hands to his head, and said, "It ached," and asked for water; he drank it, and died.'

The following description was given by the *Amherst Student* in a letter from Professor J. H. Seelye, dated Allahabad, India, November 25, 1872:—

'Not far from Agra, in Northern India, is a mission station of the Church Missionary Society, connected with which is an orphanage with several hundred children, now under the efficient care of the Rev. E. G. Erhardt. The region around is infested with wolves, by which every year numbers of children are carried off and devoured. But in two instances, at least, instead of being killed and eaten, the children have been kept alive and nourished with, if not by, these beasts. They were both boys, and apparently of some seven or eight years of age when taken. They were found at different times, the last one in March of the present year. Some hunters, smoking wolves out of a cave, were startled when the wolves appeared, by the appearance among them of a creature looking strangely human, but running rapidly on all fours like the wolves, though not so rapidly as they. He was caught with difficulty, and there was no mistaking that he was a child of human parentage, but with the habits and actions and appetites of a wild beast. The hunters brought him to the orphanage, where he was received and cared for. Though his physical form and features were sufficient to show that he was a Hindu child, there was no other indication about him of anything human. In all other respects he was, in the language of Mr Erhardt, "a perfect animal." He had no speech, but a whine. He would wear no clothes, tearing from him everything of the sort whenever put on. He would eat nothing but raw flesh, and lapped water with his tongue. When left to himself he would hide in some dark spot during the day, from which he would come out at night, and prowl about the inclosure, picking up bones, if any were to be found, and ravenously gnawing them. It at first seemed impossible for him to walk erect, but after much difficulty he was taught to do so, and also to use a fork and spoon, and to drink like a human being. Though treated with the utmost care, and with great patience and kindness, by the Christian

hands and hearts which received him, he pined away and died after he had been in the orphanage a little over four months. In all this time he could not be made to utter a word; he was never seen to smile, nor show any signs of joy, or shame, or gratitude. But Mr Erhardt, who gave me this account, assured me that his face looked more intelligent than the average of Hindu children, and that his colour and features indicated that his parentage must have been in a family of high caste. The other boy I myself saw a few days since at the orphanage, where he was brought about six years ago, having been then captured, much as was the first-mentioned boy, and having shown precisely the same habits as belonged to him. He has not yet spoken a word, but has exchanged the whine, which was at first his only utterance, for sounds expressive of pleasure, and apparently also of gratitude. He no longer prefers raw flesh for food, but eats bread and fruits with ravenous avidity. He walks erect, but with a strangely awkward gait, throwing out his hands with every step. His hands are perfectly formed, but he uses them awkwardly. A piece of bread tossed to him from a little distance, which he was eager to get, he could not catch, but let it fall clumsily to the ground. He wears clothes, to which he was at first as averse as the other boy. His forehead is low, but his face would hardly be called dull, and certainly not idiotic. His eyes have a wild and restless, but not an inquiring look. His jaws are not protruding, and his teeth are well formed and thoroughly human. On his left cheek are scars bearing plainly the marks of teeth, where he must have been fearfully bitten. He has been taught to do some kinds of work, but not faithfully. He seems to have lost all desire to escape; he mingles freely with the other children, among whom he has his favourites.'

By the assistance of my learned friend, Dr J. Murray Mitchell of the Free Church Mission, I was able to corre-

spond with the Rev. Mr Erhardt, who stated that what appeared in the papers from Mr Seelye and others were particulars furnished by himself. He wrote that the last boy was burnt out of a den together with wolves, and was such a complete animal that he must have been a long time with the beasts. His taste was that of a carnivorous animal —meat and bones—nothing else. The older boy eats now vegetables; formerly he did not. He still smells at his food before eating; the other boy knew only animal food by the smell. Everything else he dropped with the greatest unconcern. The older boy looks an idiot by the formation of his head; but the other (who died after being four months in the Orphanage) was the finest boy (I suppose physically) in the Institution, his idiocy seemed only acquired. The last few months the surviving boy has learned to speak several words, but he will never obtain full sense and power of speech. Mr Erhardt does not know whether the elder boy had marks upon his knees when caught, but the younger one had none, 'though he could not stand properly on his legs. It looked as if they could not bear his weight, but he could run very fast on his hands and knees, so much so that our boys could hardly come up with him when he bolted one day.'

On reading a paragraph in an Indian newspaper about a 'wolf-boy' who had been handed over to Dr Whishaw of the Lucknow Lunatic Asylum, I lost no time in writing to Dr John Whishaw, begging him to give some information about the truth of this case, which, for the first time, seemed to have come under the observation of one of our own profession; and I am sorry, in the interest of the marvellous, that his reply seems to throw discredit upon the whole matter. Here is a part of his letter, dated Lucknow, January 19th, 1874:—

'The boy is fourteen and an impostor; he was made up to get money under false pretences. I found him out. He

was certified to be dumb, but after he had been ten days with me he talked very well, argued, and described his life in the wolves' den. He said that the wolves resided about half a mile from the village in which his relations lived, but yet, that for five years he was not discovered, nor had he the curiosity to go and see what was going on in his paternal abode.

'He showed me the way in which he used to play with the young wolves. When the papa and mamma went out in search of food for the family he usually remained behind. Sometimes, however, he was allowed to go with them; and if one could judge of the pace he could go by the specimen of it I made him show the visitors of the asylum, the wolves would have had but poor sport and a bad dinner on the day this gentleman joined in their wild sports.

'I believe never in this world has there been an instance of a child being brought up by wolves, and I cannot understand how anybody can believe in such a thing.

'The majority of wolf-boys are idiots, taken by their parents and left near some distant police station.'

While in India I have often conversed with Hindustanis on most subjects, and am inclined to think that the idea of a child being brought up by a wolf is quite strange to those living in the Punjaub, and the country between the Sutlej and the Jumna. I never lived in Oude or the Agra districts, whence these stories seem principally to have come.

The inherent improbability of a wolf not only sparing but fostering a child whom it has carried off to devour, and of a child becoming reconciled to dwell in a wolf's den, do not require to be pointed out; but at the same time it does not appear that the thing is absolutely impossible, or so improbable that we ought to reject the testimony without considering its weight. If looked upon as a possible event it would likely take place in this way:—A wolf who had lost her cubs,

and whose maternal instinct was still excited, might, under certain circumstances, transfer it to a child. This, of course, would be a very rare event, but might now and then occur amongst a large number of instances where the children were devoured.

It must be remembered that every year in India great numbers of children are killed by wolves. In 1871 there died from snake-bites and wild beasts in the Presidencies of Bengal and Madras, 16,967 persons. There is no return from the Bombay Presidency, but it may be said in round numbers, that the deaths from such causes in British India cannot be less than 20,000 a year. Considerably more than half of these deaths are owing to snake-bites; but of those who fall victims to wild beasts by far the largest number are killed by wolves, and these for the most part are children carried off from villages or hamlets near the jungles. In Oude about a thousand people perish every year from snake-bites and wild beasts. In 1871 the number was as high as 1184, and the statistical returns are yet imperfect. Probably the number of children carried off by wolves in British India does not fall under 5000 or 6000 a year, and of these from 300 to 400 occur in Oude.

The wolf brings pieces of flesh to her cubs, which she hashes down for their use, and it will not be denied that a child could live upon such food. The wolf, though a very ferocious beast, can be tamed and become attached to man. He is nearly allied to the dog, with whom he can breed, as was known to the ancients,* and proved by the experiments of Buffon and Frederick Cuvier. There are instances of domestic animals adopting the young of other species when deprived of their own; of bitches nursing the leveret or the cubs of the otter, and of the cat nursing the young of the dog and even of the rabbit, which we read of in the news-

* See *Diodorus Siculus*, Lib. i, cap. 88.

papers. There was a story of a cat who allowed a brood of chickens to nestle under her; and another of a cat nursing a young rat amongst her kittens. An instance is on record where a male fox struck up a friendship with a lamb, 'and the pair were seen daily, seldom very far from one another.'

General Sleeman observes, 'I should doubt whether any boy who had been many years with wolves up to the age of eight or ten could ever attain the average intellect of man.' This seems a fair inference, if the cases which he describes be real ones. It would certainly be one of the most remarkable facts in the nature of the human mind that, by living for years with wild beasts, by imitating their habits and yielding to the suggestions of their brutal natures, the growth of the intellect should be permanently arrested at the early age of eight or ten, and that a condition of idiocy should, as it were, be implanted by the boys sharing the wild life of a beast of prey, and this without any disease either of the sensory nerves or of the brain. This is a second improbability more startling than the first, and is opposed to what is known of the educability of the idiotic, and of the deaf and dumb.

It is clear that these Hindustani boys were actually idiots, whatever the cause of the idiocy may have been. It is not said that any of them were deaf, but they were all mutes. Some of them snarled or growled like wolves or dogs; one of them was never heard to speak till within a few minutes of his death, when he put his hands to his head, and said, 'It ached,' and asked for some water. This reminds one of a microcephalous idiot, described by Vogt, who, all his life a mute, spoke a few words during his last illness, and asked for something to drink, named a few articles of food, and said that his head ached.

Two of these boys could not be made to wear clothes, and one could only be got to do so with difficulty. It is to be re-

membered that Oude is a country where the cold is never very severe, and where many boys go almost naked. Some traces of their wolfish training are noticed. In one the front of his knees and elbows had become hardened, from going on all fours with the wolves. One case at the Agra Mission ran rapidly on all fours. Another, mentioned by Sleeman, ran nearly as fast as the wolf whelps ; a third ran quite as fast as the wolf; and of a fourth it is actually said he could run so fast on all fours that no one could overtake him.

They all ate raw meat, and preferred it to other food. One fed on carrion, and frogs which the boys of the village caught and brought to him. One boy, when drinking, dipped his face in the water and sucked it up ; another is said to have lapped water like a dog.

The number of cases we have to deal with are seven, and of these one was forced out of a wolf's den by hunters smoking it ; another was dug out of a wolf's den by a trooper (who had seen him run into it), with the help of some villagers ; a third was seen in company with two wolf whelps by two native soldiers watching for wild boars ; a fourth was seen by a shepherd, trotting on all fours by the side of a wolf; and a fifth was seen drinking along with two wolf whelps by a trooper and another man. The manner of finding the other two is not given in detail. In no case do these original witnesses appear to have been examined by the narrators. The statements by General Sleeman that several of these children, after being taken from wolves, were recognised by one or other of their parents, who were widows or poor people, seem to me a very suspicious confirmation of the stories. Hindustanis, especially poor widows, are very ready to claim foundling boys in India, under the hope that, brought up as their own children, they will provide for their assumed parents when they are old. I could give a striking example of this from my own experience ; and it is note-

worthy that those who obtained the wolf-children under the statement that they had been taken from them by wolves, all abandoned them when they found that they were idiots. The Hindus would be fain to get rid of an idiot child, because he would be continually endangering the loss of caste to his parents, by eating forbidden food. One of my servants, a Chamar, lost his caste because his wife, who had gone mad, was seen to drink water from the hands of a Mussulman.

The imagination of the Hindustani is plastic; he is fond of the marvellous, more disposed to believe anything not immediately concerning his private affairs than to go and examine it. He is not a rigid and strict observer, like educated Europeans living in these scientific and critical times. His notions of veracity are lax and easy. Though having nothing like the great experience and opportunities of General Sleeman, I could have collected during my residence in India as many stories of ghosts or sorcerers, and as well attested as these narrations of children being seen with wolves. Since my first paper on this subject, now above twenty years ago, I have met with some gentlemen who have seen the idiot boy in the Secundra Orphanage; but nothing fresh was elicited about his origin.*

* Dr J. Murray Mitchell kindly sent me the *Lucknow Witness* of June 19, 1874, containing a letter about wolf boys, part of which is here quoted :—

'When the late Sir William Sleeman was Resident at the Court of Lucknow, he interested himself much in this matter, and evidently believed that wolves did occasionally carry off children to their dens, and, contrary to their natural instincts, rear instead of devouring them. The writer of these lines, whilst employed in the Oudh Frontier Police, received an order from General (then Colonel) Sleeman to proceed from Sultanpore, Oudh, to Fyzabad, in order to secure a boy then said to have been seen in the latter place, who had been nourished by a wolf.' The specimen which this officer obtained did not appear to be genuine. He adds, "that when the Oude Durbar discovered what they considered to be a 'shauk' (desire) of the Resident, they hastened to produce several unfortunate idiots, positively declaring them to be 'wolf boys.'"

'Although the writer has heard of frequent instances of "wolf boys" having

In a paper entitled 'Wild Men and Beast Children,'* the author, Mr E. Burnet Tylor, cites from Bernard Connor's *History of Poland*, a letter from the Dutch Ambassador to England, Monsieur de Cleverskerk, who was in Warsaw in 1661, where he saw a boy at a convent, who, he was told, had been caught sometime before at a bear-hunt. 'The description of him comes to this, that the boy was a half brutal idiot, who ran on all fours to seize the bread which was given to him. Another account of this case,' continues Mr Tylor, 'is given by Koenig, from *Hartknoch de Republica Polonica*.'

He says that in the year 1661 two boys were found in company with several bears in the woods of Grodno. 'One of them escaped with the bears into a marsh; but the other was taken. This boy, assumed to be eight or nine years old, went on all fours, and ate greedily such things as bears love, such as raw flesh, apples, and honey. He was taken to the king at Warsaw, and baptised Joseph. With some difficulty he was taught to walk upright. He could not

been found in Oudh villages, no instance has ever been cited to him of the discovery of a "wolf girl"! Surely it is too much to be asked to believe that wolves would be influenced by sex in the choice of subjects on whom to bestow their strange tenderness!

'The writer thinks that these unfortunate creatures were simply idiots who, straying away from the place of their birth, wandered, driven by hunger from their parents or friends, themselves not being over anxious to search for and bring back to their homes such burdens on their scanty means. It must be remembered that in the days when Oudh was under its own rulers, there existed no asylums in which to shelter idiots, and they roamed about in perfect liberty, supported by the liberality of the people.

'The writer thus concludes: "It will most probably be found on inquiry that since the annexation of Oudh no fresh instances of the existence of 'wolf boys' have been brought to notice, and if this is found to be a fact, it will go far to cast disbelief on the weird stories formerly so current in Oudh, and which, apparently, had no other foundation than the mere assertions of ignorant villagers, assertions which under the present rule would be subjected to the strictest scrutiny before being accepted as trustworthy." O. P. A.

'Musoorie, 30th May 1874.'

* See *The Anthropological Review*, vol. i, No. 1. London, 1863.

learn to speak Polish, but expressed himself with a bear-like growl (*murmure ursino*).' *

The king gave him to a chamberlain of Posnan, who employed him to cut wood and do simple work, 'but he never lost his wildness, and would sometimes go off to the woods, where the bears never molested him,' very likely because he had been brought up by one of their relations. That a boy should be fostered by a bear seems more credible than that he should be fostered by a wolf. A bear is of much less savage temper, and is not a purely carnivorous animal. I have heard it said that the bear, which is sometimes still seen in the South of France, can often be approached with safety. There is a story told in Mr Atkinson's *Travels in Siberia* of two children, one four and the other six years of age, seen by their mother playing with a Siberian bear; one of them was feeding it with fruit, the other riding on its back. On the mother running up the bear quietly walked off. It does not thus seem so incredible that a bear should become the companion of a deserted child, and that they should become attached to one another and be found together in the woods. The son of a missionary whom I knew at school had a story, which he averred was perfectly true, of a Kaffir boy being carried off by the baboons, and kept several years by them amongst the rocks. He was at last caught, not being able to climb so well as the baboons, and was brought back to his parents. He said that the monkeys treated him with a certain distinction, and always allowed him to drink first.

For an account of other cases of a similar kind the most accessible reference is the paper of Mr Tylor. The same explanation seems to do for them all, that idiots have occa-

* This is probably the boy mentioned by Leibnitz: 'Car lorsqu' on presenta à Jean Casimir roi de Pologne un enfant sylvestre, pris parmi les ours, qui avait beaucoup de leurs manières, mais qui se fit enfin connaître pour animal raisonable.'—*Nouveaux Essais*, Liv. iii.

sionally been found straying in the woods, and that people accounted for their wildness and stupidity, their want of speech, and their abnormal sense of taste, by supposing that they had been brought up by or lived in the company of wild beasts.

The notion that the cruel wolf—the terror of mothers for so many ages—or the shaggy and formidable bear had sometimes spared the innocents whom it had snatched from the cradle, or found wandering in the fields on the borders of the old forests, would be a myth in accordance with the traditions of the nursery.

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NOTICES IN FOREIGN PERIODICALS.

'Ireland sich auf all den so disparaten Gebieten als tüchtiger Kenner erweist; bei der ausgesprochenen Bestimmung des Werkes auch für Nichtfachleute handelt es sich in den speciell für die letzteren wichtigeren Abschnitten nicht um die Darlegung durchaus neuer Forschungen, aber die volle auf eingehender Benutzung der Literatur basirte Beherrschung des Stoffes wird selbst für jene viel Belehrendes bringen, zumal als überall die reiche Erfahrung des Verf Erläuternd herangezogen ist mit der in England zumeist geübten klaren Darstellung des Stoffes harmonirt die gleichfalls dort übliche prächtige Ausstattung des Werkes.'—*Neurologisches Centralblatt*, No. 21, 1885.

TRANSLATION.

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TRANSLATION.

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TRANSLATION.

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TRANSLATION.

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TRANSLATION.

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TRANSLATION.

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NOTICES OF THE SECOND EDITION.

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Translation.

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Translation.

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STUDIES IN PSYCHOLOGY AND HISTORY,

By W. W. IRELAND, M.D. Edin., &c.

'Prosequitur dictis, portaque emittit eburna.'—*Virgil.*

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'The chapters upon the Swedish sage are much the most important and interesting in the volume. They condense for us the strange history and experiences, in the spirit and out of the spirit, of this greatest of latter-day dreamers, as these are found voluminously related in his books and in those of his disciples. As Dr Ireland says, there seems no tenable alternative between accepting Swedenborg as a vehicle of inspiration, and recognising him to be the victim of delusions that can be traced to derangements of the brain. The first hypothesis he leaves to the followers of the seer to make good. The second Dr Ireland supports by citation of the acknowledged events of Swedenborg's life, and of the internal evidence of his works.'—*Scotsman*, 21st October 1889.

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'How Ashbourne wooed the beautiful Irene is very prettily told. . . . For literary quality and personal interest the chapter descriptive of Akber Badsha is perhaps the best in the volume. Dr Ireland has in a few vigorous strokes limned a commanding character, which shows the real touching the ideal. There are many wise and pithy sayings and sentences interspersed throughout the volume, but in Akber is the centre of the author's ideality. Dr Ireland's style is clear and nervous, and his "Golden Bullets," while offering much entertainment to the pleasure-seeking reader of fiction, also contains many elements of enduring interest and deep import.'—*Glasgow Herald.*

'The story is interwoven with abounding Oriental intrigue and war. It ambles agreeably through a well-printed volume, and is a welcome variation from the ordinary platitudes of the three-volume order.'—*Saturday Review.*

'The fictional interest of the book is well sustained, while it presents a carefully studied and accurate picture of certain phases of Indian politics and society. Dr Ireland's style has a simplicity and directness which give his narrative the flavour of a veritable chronicle, so that it is very pleasant reading alike for young and old.'—*Scottish Leader.*

'He introduces us to men and women, not to puppets; and he manages to convey to the western mind some real conception of Hindu habits and ways of living. Those who read the story will be eager to learn more of Indian history.'—*Inverness Courier.*

'The central figure is the supercargo of the British ship *Unicorn*, which was burned in the port of Surat, and the story is interwoven with plenty of adventures, Oriental intrigue, and war. It is well written throughout, and comes as a welcome variation from the well-worn platitudes and *persiflage* of the ordinary three-volume novel.'—*Weekly Court Directory.*

'The perpetual petty intrigues, incident to every phase of Indian life, from Selim, otherwise Jehangir, to the revengeful, clever woman, Mihrunisa, are well depicted, and will confirm all our floating suspicions of Oriental duplicity. One of the most interesting episodes is the account of the Jesuit Mission under Jerome Xavier, who carried on the evangelistic labours of his greater relative, Francis Xavier, the apostle of the Indian Continent.'—*Belfast Newsletter.*

'*Neque semper arcum tendit Apollo* seems to be a suitable motto for the author of the above book, for on various occasions, by way of relaxation, he has abandoned for a time the abstruse study of psychology, and wandered into the region of romance and fiction. Dr Ireland is already known to the scientific world as one of our leading British neurologists, and also as a copious contributor to psychological literature, his principal works being his treatise on "Idiocy and Imbecility," and his "Blot upon the Brain." The former is the standard work on the subject of which he treats, and the latter, being written in a popular style, is calculated to interest persons of culture beyond those interested in medical psychology, as the author dwells upon the mental peculiarities of European dynasties; and his chapter on the career of the early Roman Emperors, as viewed through a psychological medium, is of great value to the classical and historical reader. This more recent work, "Through the Ivory Gate," embraces a series of historical studies, which are of intense interest to the reading public generally.

'"Golden Bullets," the work before us, is an historical romance, the scene being laid in India during the reign of the great Mogul Emperor Akber, and of our own Elizabeth. Its appearance is especially opportune at this juncture, when England and Portugal are striving for supremacy in Africa, for the story opens at a time when England and Portugal were trying to supplant each other in Asia. It gives a vivid picture of Indian life and Indian manners and habits at the most brilliant period of Mussalman rule. It is characterised by purity of style and elegance of diction, and shows abundant evidence of the literary culture and scholarship of the author. Like some of Dr Ireland's other works, it penetrates into the domain of historical psychiatry; and containing, as it does, graphic details of the political, theological, and domestic history of India some three centuries ago, it must necessarily command a large circle of appreciative readers.'—*Eastern Daily Press.*

'It would deprive the reader of "Golden Bullets" of all his pleasure were the details of the adventures of Stephen Ashbourne mentioned in this place; all, therefore, that shall be revealed here, after a reading of the book twice told, with twice told pleasure, is that the pictures of life in India, at the moment when English eyes were first set upon it, and the crown of the Empress of India was in embryo, are rich in information, that the story of adventure and of enterprise holds on all through the narrative, that a pure and chastened interest of love is recorded with a charming romance surrounding the lovers, and that all is so pointedly told, it seems as if it could not be a novel but must be a real history, written by one who was present in the making of it. As a contrast to the childish frivolity of the popular novel now floating in the book market, "Golden Bullets" is great indeed. There must surely be a reading class to whom this contrast will be a joy as well as a relief, and from whom a knowledge of the work will be disseminated with the honourable and useful motive of giving to good art in literature its true value and quick currency.'—*Asclepiad*, 4th Quarter, 1890.

'The story abounds in stirring incidents, and the interest never flags from the time when the *Unicorn* sets sail for Surat in 1599, till the hero is left in a valley of the Himalayas ruling over a new State and meditating a more perfect system of laws. The movements of the small company of Englishmen were keenly watched, adversely criticised, and frequently hindered by the Jesuit missionaries, who were jealous of the favour in which the Emperor Akber held them. It may safely be put into the hands of the most confirmed novel reader, nor will such a one readily lay it aside till he has finished the very last page.'—*Scots Magazine.*

'War, intrigue, treachery, plots most cunning and most diabolical, daring actions, instances of devoted love, go to make up a really excellent romance.'—*Haddingtonshire Advertiser.*

'The wonderful man whose genius for conquest brought him empire, and whose elevated understanding emancipated him from the influence of his surroundings by inspiring him with a broad and generous philosophy immeasurably in advance of his epoch, is presented in these pages with fair accuracy, and his personality is so deftly merged into the tale that it cannot escape due appreciation. The hero of the little drama is Stephen Ashbourne, an Englishman, who, having proceeded to India on a commercial enterprise, is prevented from returning owing to a disaster to the vessel which conveyed him; and who, having some knowledge of gunnery, as then understood, joins many members of the ship's crew in the service of Akber. He has numerous surprising experiences.'—*Broad Arrow and Naval and Military Gazette.*

'Dr Ireland may be congratulated on having succeeded where more than one big man before him has failed. It is not given to many, even among the great ones of literature, to write in a way acceptable to men and to boys, to produce work which may be criticised in the smoking-room of the "Athenæum" or the "Saville," and which may also be trusted to keep the youngsters out of mischief of a wet afternoon. Charles Kingsley, in his "Water Babies," did not succeed in interesting the play-room; while, on the other hand, who remembers anything, except through "Robinson Crusoe," of Daniel Defoe? The work now before us has, however, one material disadvantage in its very excellences, inevitably suggesting, as it does, comparison with the tales of Louis Stevenson and the romances of Walter Scott. It is no small praise to say that, without being less readable, its tone is healthier than that of the "Master of Ballantrae," while the description of Akber in his son's camp has something of the ring of the "Talisman" about it, recalling indeed one of Scott's finest passages about the great Saladin. Dr Ireland has the characteristic defect of his great predecessor. Stephen Ashbourne,

the hero of "Golden Bullets," is about as colourless a person as Ivanhoe, and just as we rise from Scott with memories of Di Vernon and of Rebecca, of Effie Deans, or of Lucy, rather than of his titular heroes, so, on closing "Golden Bullets," we recall not so much Stephen Ashbourne or Benedict de Goës, or even Akber himself, as the heroic Sultana, the Circassian bride of the Emperor, and the two Eastern wives of Ashbourne, all of them sketches full of vivacity and insight, pleasant and piquant withal. . . . Those were days when each man had to be something of everything, when there was a touch of the statesman about the "man on 'change," and more than a touch of the warrior about the officers and seamen of our mercantile marine. It is not too much to say that Dr Ireland makes these stirring days re-live for us in his pages, nor will the veriest schoolboy fail to catch some just idea of everyday life in a century which knew not in India of the English *raj*. . . .

'Among the "side views" which this admirable romance affords us, we get a fine sketch of Agra in the days of its splendour (p. 91), of life within a Court seraglio (p. 201), and above all, a most interesting attempt to realise for us the daily routine of an Eastern home.'—*Journal of Mental Science*, January, 1891

'Better known to our profession as the author of "Through the Ivory Gate," and other brilliant studies in mental disease and therapeutics, Dr Ireland is not only a capable military historian of the stirring times in which he was a daring actor, but he has now entered the field of romance as an historical novelist. We have a lovely heroine, a disappointed lover, a wicked prince, and a comic Brahmin, with a little captive who is a cross between Topsy and Mrs Naaman's servant, all described in good Saxon, with plenty of local colouring, in a way which in one volume compresses the incidents of an ordinary three volume novel.'—*Edinburgh Medical Journal*, January, 1891.

'The novel opens well, and if the plot is a little slow in developing, it is complicated enough when it comes, and the incidents are sufficiently exciting to stimulate even a jaded appetite. As to the faithfulness of the pictures of Indian scenery and Indian life there can be no doubt; and the reader, once embarked with Stephen Ashbourne on his adventurous voyage, will pick up many novel impressions and new facts before he lays the book down, leaving the hero in a position to excite the envy alike of the philosopher and the man of action.'—*British Medical Journal*.

'The book may be recommended to young people for entertainment, with a flavour of instruction.'—*Athenæum*.

'A picturesque tale, full of interest, and with the accessories, as far as we are able to judge, carefully studied. The intrigues of the Court, the policy of the Jesuit missionaries, the contending claims of rival princes, and a variety of other interests are skilfully connected with the fortunes of Stephen Ashbourne and his lady-love, Irene. The story is worth reading for itself, and for the light which it throws upon a period about which most of us know very little.'—*Spectator*.

'It is not the study of Stephen Ashbourne, however, that makes Dr Ireland's book so readable, it is the picture of Akber's court and courtiers, to which the story itself must be regarded as merely subsidiary. . . . Certainly, before reading Dr Ireland's book we had never felt so intimate with the remarkable characters of Akber, the Mogul Emperor; Abul Fazl, the historian; and Hakim Ali, the sceptical physician of the court.'—*Madras Mail*.

'The novel is one of sustained and intense interest, far superior in graphic power and realism to the stories of Colonel Meadows Taylor. . . . "Golden Bullets" is not only for Europeans, but for those natives who are anxious to study incidents of the courts in the days gone by, before the British became a power in the land, and to them we can thoroughly commend the book. Dr Ireland is to be congratulated on having placed before the public a work at once so useful historically, and so full of dramatic incidents.'—*Calcutta Englishman*.

'"Golden Bullets" is a pleasing, entertaining story, written in that charming style for which the author is already famous.'—*Alienist and Neurologist*, St Louis, U.S., October, 1891.

TRANSLATED FROM THE NORSE.

'One can hardly do better in a pleasant way than read "Golden Bullets," a historical novel, by the Scottish physician, many-sided *litterateur*, and scientific author, William W. Ireland. We have read the book with great interest, and have much pleasure in recommending it to our English-reading public. . . . Dr Ireland went as a young surgeon to India, and he has from that time produced several remarkable literary works. Amongst others, he has described the siege of Delhi, in which he took part, and where he was wounded. He went to the Himalayas, where he lived a long time among the natives. He had thus the richest opportunity of studying the subject treated in "Golden Bullets," and which is instructive as well as easily read and entertaining.'—*Bergens Aftenblad*, 22nd August, 1891.

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